

THE WORLD IN OUTLINE
WITH EMPHASIS ON THE BRITISH EMPIRE

**Printed and published by Apurva Krishna Bose,
at the Indian Press, Allahabad**

PREFACE.

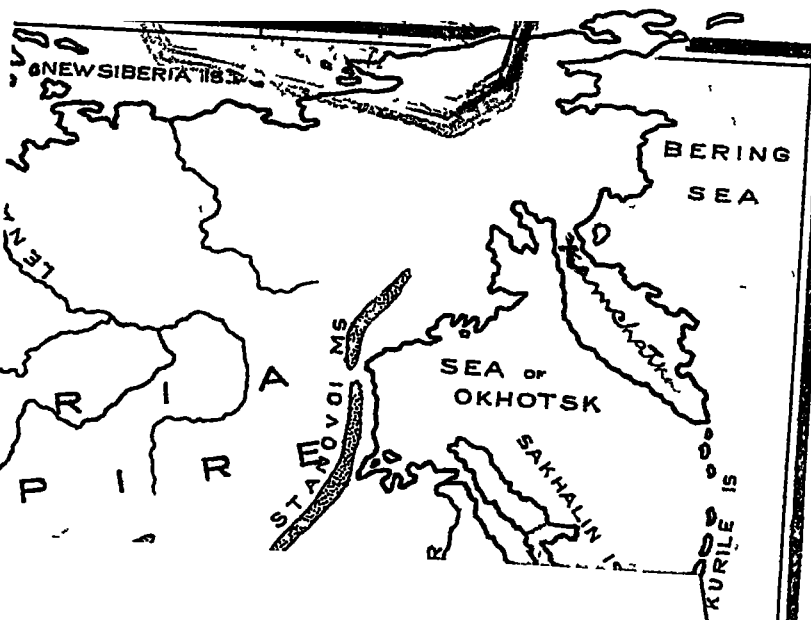
WITHIN recent years there has been no scarcity of excellent books on Geography. It is difficult, however, to find a book which is suitable for Indian High Schools. There are objections to books published for schools in England the British Isles are treated in too great detail, and, on the other hand, Asia is treated too briefly; questions of climate, vegetation, etc., are discussed with reference to conditions prevailing in Great Britain, and the language is frequently too difficult. The present book has been written from the point of view of the Indian pupil.

The book is meant for pupils preparing for the Matriculation Examination of the Allahabad University and for the School Leaving Certificate Examination of the United Provinces. The syllabus prescribed for these examinations consists of three parts: (i) General Geography of the World in outline, (ii) Physical Geography, and (iii) Geography of the Indian Empire. This book covers the first two of these sections. The Geography of the Indian Empire has been omitted, as suitable books are already available for the study of the third section of the syllabus.

CONTENTS.

CHAPTER	PAGE
I. Asia Position	1
II Asia Coast-line	5
III The surface of Asia	19
IV The rivers of Asia	27
V The climates of Asia	34
VI The countries of Asia	41
VII Seas and coasts of Europe	62
VIII Surface features of Europe	70
IX Climate and vegetation of Europe	76
X The countries of Europe	83
XI North and South America—	115
(i) Surface and rivers	ib
(ii) Climate and vegetation	120
(iii) People, countries and chief towns	124
XII Africa—	140
(i) Surface and rivers	ib
(ii) Climate, vegetation and people	146
(iii) The countries of Africa	154
XIII Australia and New Zealand	164
XIV Physical Geography	180
The Solar System	ib
Phases of the moon ..	183
The shape of the Earth	185
The movements of the Earth	186
Day and night	187
The seasons	ib
Latitude and Longitude	191
Longitude and time .	197
The Zones	200

	PAGE.
The land surface of the Earth . . .	202
Earthquakes . . .	208
Volcanoes . . .	209
The work of rivers . . .	210
Rainfall . . .	212
Climate . . .	216
Effect of latitude . . .	216
Effect of altitude . . .	218
Effect of distance from the sea . . .	219
Winds . . .	221
The monsoons . . .	223
Effect of mountains . . .	224
The movements of the Ocean . . .	224
Waves . . .	225
Tides . . .	226
Ocean currents . . .	227



ASIA.

CHAPTER I.—ASIA : POSITION.

If you look at a globe or a map of (the) world, you will see five great land-masses, each nearly or quite surrounded by water. These are *Africa*, *Australia*, *North America*, *South America* and the largest mass. *Europe* and *Asia*. This last mass is generally spoken of as being made up of two continents—*Asia* and *Europe*. Let us find out whether these two are really distinct from one another.

Trace the land boundary between them. It runs near the **Ural Mountains** and the **Ural River**. On each side, there stretches a great rolling plain; the people on the Asiatic side belong to the same race and empire as those on the European side, and the climate trees and crops are similar too. As a matter of fact, the **Ural Mountains** are not a great barrier like the **Himalaya Mountains**. In many places they are so low and their slopes so gentle

that a traveller can pass from one side to the other with the greatest ease. (So we conclude that the great plain in the north of Asia and Europe is one, and the Ural Mountains are like a long fold or wave in its surface, stretching for 1,500 miles from north to south. In the same way, the build of the two continents in their southern portions is very similar, for they both consist of great highlands and mountain chains, with plains and valleys between them. From the point of view of geography, then, it seems to be more correct to speak of Asia and Europe as one continent, and of Europe as being a great peninsula, jutting westwards from the mainland of Asia. The name given to the whole land-mass, according to this view, is Eurasia.

In many ways, Asia is the most remarkable of all the continents. First of all, it is the largest. It contains one-third of all the land surface of the globe. It is half as large again as Africa, nearly five times as large as Europe, six times as large as Australia, and as large as North and South America put together.

It stretches from the Equator to the Arctic Ocean. Find **Singapore** on the map. It is on a small island, quite close to the most southerly point of the main-land, and is only 90 miles from the Equator. Now find the most northerly point of the continent: it is only 900 miles from the

North Pole. With so great a length from north to south (more than 5,000 miles), Asia has every kind of climate, from very cold in the north to very hot in the south ; and, as vegetation depends a good deal upon climate, it has almost every kind of tree, and crop to be found on the Earth's surface.

Again, Asia has a very ancient history. There were mighty empires in the south of Asia when Europe was still uncivilized. And you may perhaps know already that the four great religions of the world began in Asia. Gautama, the Buddha, who founded Buddhism, was born in India, where Hinduism also took its rise. Muhammad, the founder of Islam, was born in Arabia, and Jesus Christ, whose followers are called Christians, was born in Palestine.

Boundaries. — We have seen that on the west Asia is continuous with Europe. There are also three seas along the border on this side. Find them on the map. They are the Caspian Sea, the Black Sea, and the Mediterranean Sea. On the north east and south, Asia is bounded by the ocean.

To the north lies the Arctic Ocean, which is not really a separate ocean, but a part of the great Atlantic Ocean. Here the sea is nearly always blocked with ice, and trade along the north coast of Asia is therefore impossible.

The eastern coast of Asia borders the Pacific.

Ocean, the north-eastern corner being separated from North America by Bering Strait, only 36 miles wide. Look at the globe, and see how the Pacific Ocean widens out towards the south. From Singapore you would have to travel half-way round the world to reach the coast of America

To the south of Asia is the **Indian Ocean**, divided into two parts by the Indian peninsula. You learn a good deal about this ocean in studying the geography of your own country. Trade-routes go south-east to Australia, south-west to Africa, and west to Europe. You should try to find these routes on the globe or the map, so as to learn how travellers from Asia get to the other continents.

Questions.

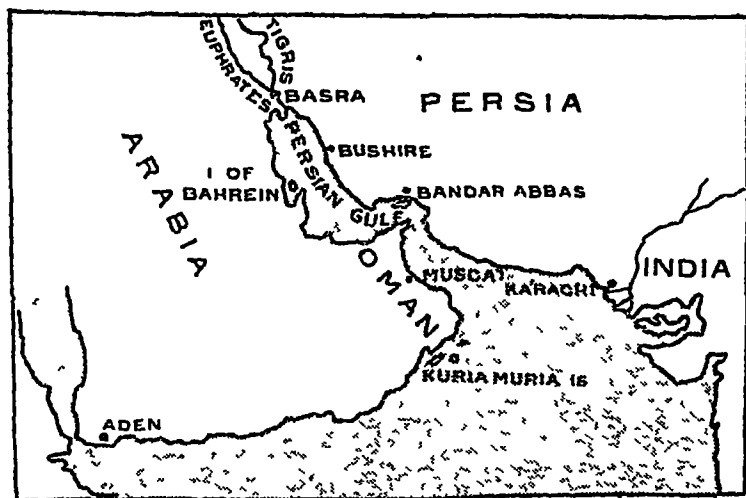
1. Give reasons for regarding Asia and Europe as one continent
2. Compare the size of Asia with that of the other continents
3. In what ways is Asia specially remarkable (a) as to its geography, (b) as to its history?
4. Across what oceans would you sail from India to reach (a) Africa, (b) Australia, (c) America?
- ✓ 5. On an outline map, mark some of the chief ocean routes from Asia to other continents, also the boundary line between Europe and Asia

CHAPTER II.—ASIA : COAST-LINE.

In studying the coast-line of Asia, we shall first start from Karachi and travel westwards, and afterwards make a voyage round the eastern shores of the continent from Rangoon. You learn about the coast-line between Karachi and Rangoon when studying the geography of the Indian Empire.

Coast-line (1).

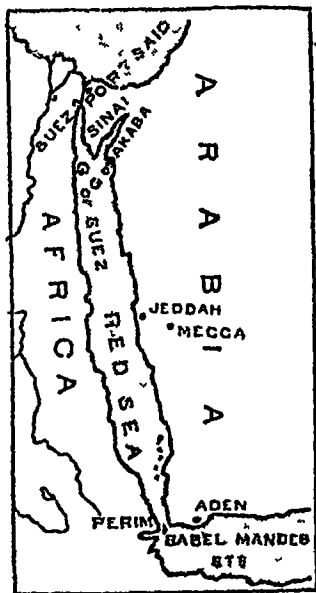
The journey from Karachi to the **Suez Canal**, and even beyond, is along barren and uninviting coasts, which border a great desert. Barre, parched hills or hot sandy shores meet the eye the whole way, except for a line of palm trees here and there



Coast-line Karachi to Aden.

We first come to the **Persian Gulf**. - Find out from the map the name of the ^{*Gulf of Oman*} ~~outer~~ ^{*Chagarmay*} ~~gulf~~ and the strait by which you enter. The Persian Gulf is shallow. It is being very slowly filled up by the silt brought down by the rivers **Tigris** and **Euphrates**. Find the island of **Bahrein**. It is the largest of a group which belongs to Great Britain, and has a very valuable pearl fishery. Pearls worth many lakhs of rupees are sent for sale to Bombay every year.

The port of **Aden**, at the south-west corner of Arabia, is a most valuable British possession. It is only a small town on a little barren peninsula at the corner of a desert, but it has a fine harbour, and it is very strongly fortified. It has two important uses - it guards the southern entrance to the Red Sea, and it keeps a large stock of coal from which passing ships are supplied.



Coast-line Aden to Port Said

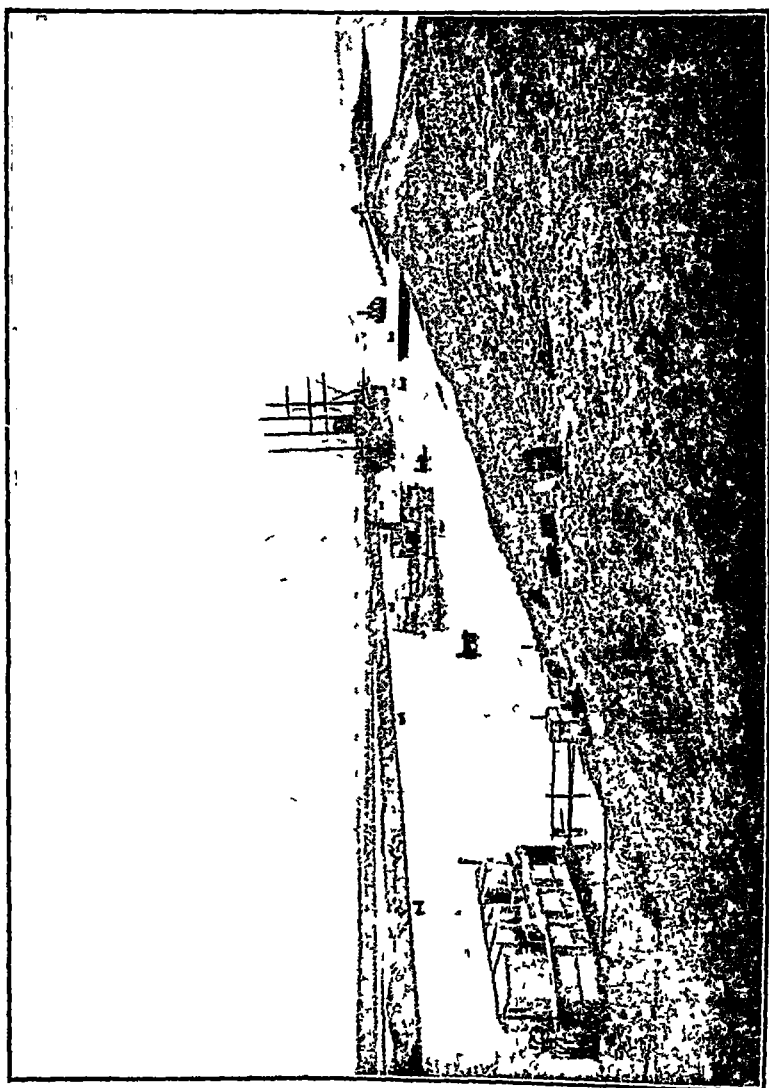
'the gate of tears' There are two straits, separated by the British Island of

Perim. Years ago, ships were often wrecked on this island, and this gave the straits their sad name, but the British have built a light-house on the island, and wrecks are now never heard of.

You will notice, if you look at the map, that no rivers enter the Red Sea, for it lies between two deserts. The voyage from Perim to the Suez Canal is on this account very hot and unpleasant, and although the Red Sea is a long opening into the land, its water is not cool, and it does not improve the climate

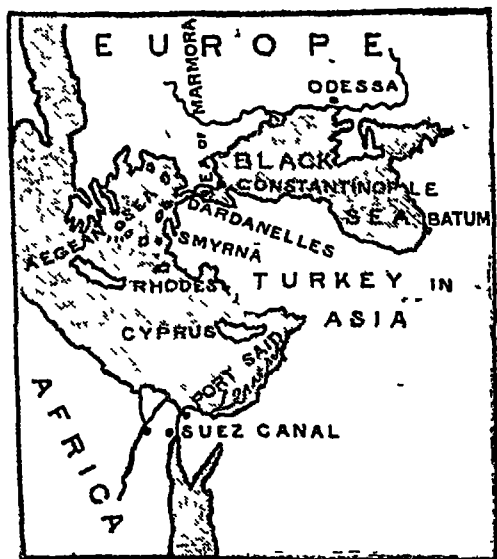
At its northern end, the Red Sea divides into two narrow gulfs. Find out from the map their names and the name of the peninsula between them. We travel along the western gulf and soon reach the town of **Suez**, which gives its name to the gulf to the south, and to the canal which goes north to **Port Said**.

The **Suez Canal** was opened in 1869. Before that time, the sea journey from England to India was round the south of Africa, and took many months. Now it can be done in three weeks, as the Suez Canal route is very much shorter. The distance from **Suez to Port Said** is 87 miles, but the length of the canal actually dug was only 66 miles, the remaining 21 miles of the route being through two lakes. While in the canal, ships have to travel very slowly; for, if they were to go at full speed,



the waves caused by the vessel might wash down the sandy banks and fill up the bottom of the channel. About 5,000 ships pass through the canal every year, so Port Said is a very busy place. It is a very important coaling station.

We now enter the Mediterranean Sea. Look at its size on the map. It is the largest inland sea in the world, and the countries round its shores enjoy a delightful climate. The eastern end of the sea is called The Levant, a word which means 'the East'. We travel first north, and then west, leaving the large British island of **Cyprus** in the angle of the two coasts. The shores are now green, and the small coast ports have a large trade in fruit.



Coast-line Port Said to the Black Sea

At the **Island of Rhodes** we turn north and wind our way among the many islands of the **Ægean Sea**. Here the sea is shallow, and many boats may be seen engaged in sponge-fishing.

European Turkey is divided from Asia by the narrow straits of the **Dardanelles** and the **Bosphorus**, with the **Sea of Marmora** between them. The city of **Constantinople** stands on the European side of the Bosphorus, and the straits are a very busy place of trade.

We now enter the **Black Sea**, and, with the exception of one or two small ports, pass nothing of interest, until we reach the border of Europe in the south-eastern corner.

Questions.

1 Describe a coasting voyage (a) from Karachi to Aden; (b) from Port Sud to the Bosphorus

2 On an outline map, write the names of the chief seas, gulfs, straits, islands and ports passed in a voyage from Karachi to the Black Sea

3 Using the scale of the map in your atlas, find, as nearly as you can, the distance in a direct line between (a) Bombay and Aden, (b) Port Said and Dardanelles.

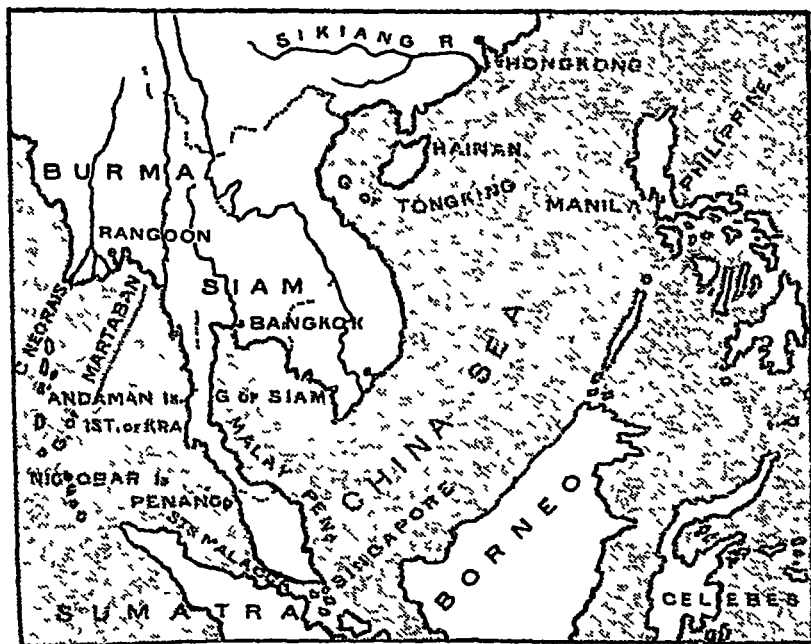
4. Can you find the coast-line of Asia?
 Now let us find the coast-line of Asia.

Coast-line (ii).

We will now take a journey round the coasts on the other-side of Asia, and this time we will

start our journey from Rangoon, the great eastern port of the Indian Empire

(Far away on our right, as we go south from the **Gulf of Martaban**, is the small group of the **Andaman Islands**. These islands are the tops of mountains which rise from the floor of the ocean.) Look at your map, and follow with your finger ^{the range of mountains} ~~(the range of mountains)~~ which runs near the



Coast-line Rangoon to Hong-Kong

coast of Burma, as far as **Cape Negrais**. Now let your finger pass on to the **Andaman Islands**, the **Nicobar Islands**, **Sumatra**, **Java**, and

the rest of the long chain of islands which curves round to the east. You will see at once that (this is one long range of highland, although the greater part of it rises out of the sea, and not from the dry land. It is probable that all these islands were once joined to the mainland, and that the space between the Andaman Islands and the **Malay Peninsula**, where the sea is very deep, was a large inland lake.

But let us continue our journey along the mainland coast. The first thing that strikes us is the difference between these shores and those visited in the south-west of the continent. There we passed miles and miles of hot barren desert, with very few ports or even villages. Here, and for hundreds of miles along the south-eastern and eastern coasts of Asia, the country is covered with rich vegetation, and there are numberless busy villages and many large and thriving ports.

For nearly five hundred miles we pass the shores of Lower Burma, but at the **Isthmus of Kra**, British territory ceases, and the coasts of **Siam** begin. We soon enter the **Straits of Malacca**, and here we see the British flag flying again. Find the island of **Penang**. It is one of the **Straits Settlements**, the name given to the British possessions in the Malay Peninsula.

We now reach **Singapore**, another British

possession, and one of the most wonderful ports in the world.) It does not import very much for its own use, neither does it export its own produce. (It does for sea trade what a railway junction does for land trade. It receives goods from north, south, east and west, and distributes them in all directions. For instance, a ship sailing from China to London will leave goods here to be taken by other ships to Australia, or Calcutta, or to small ports, along the coast and on the islands, at which the steamer does not stop. You may be surprised to learn that nearly 12,000 ships visit Singapore in a single year.)

(From Singapore we travel northwards. Notice that there are really two coast-lines on the east of Asia, one belonging to the mainland and the other to the island chain.

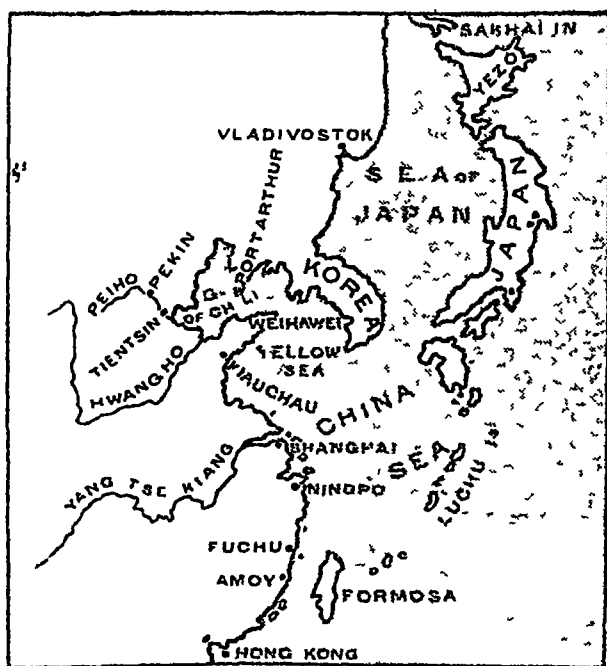
We enter first the South China Sea, bounded by the large island of Borneo, and the Philippine Islands.) Two gulfs thrust ^{at sea} themselves into the land. Find out their names from the map.

(The eastern portion of the Indo-China peninsula, which we now pass, belongs to the French, and we see several small ports, but large steamers do not often visit them, and the trade is mostly with Singapore and Hong-Kong, which we reach after passing the forest-clad ^{at sea} Island of Hainan.

(The island of Hong-Kong is opposite the

mouth of the **Si-kiang** river, and is a most valuable British possession, for it protects our trade in China and the Far East. It is strongly fortified, British and Indian soldiers are stationed there, and it is the head-quarters of the British fleet in this part of the world.

(Find **Shanghai** on the map. The coast of China, from Hong-Kong to Shanghai, looks like a wavy line, but there are really hundreds of little



Coast line ' Hong-Kong to Korea

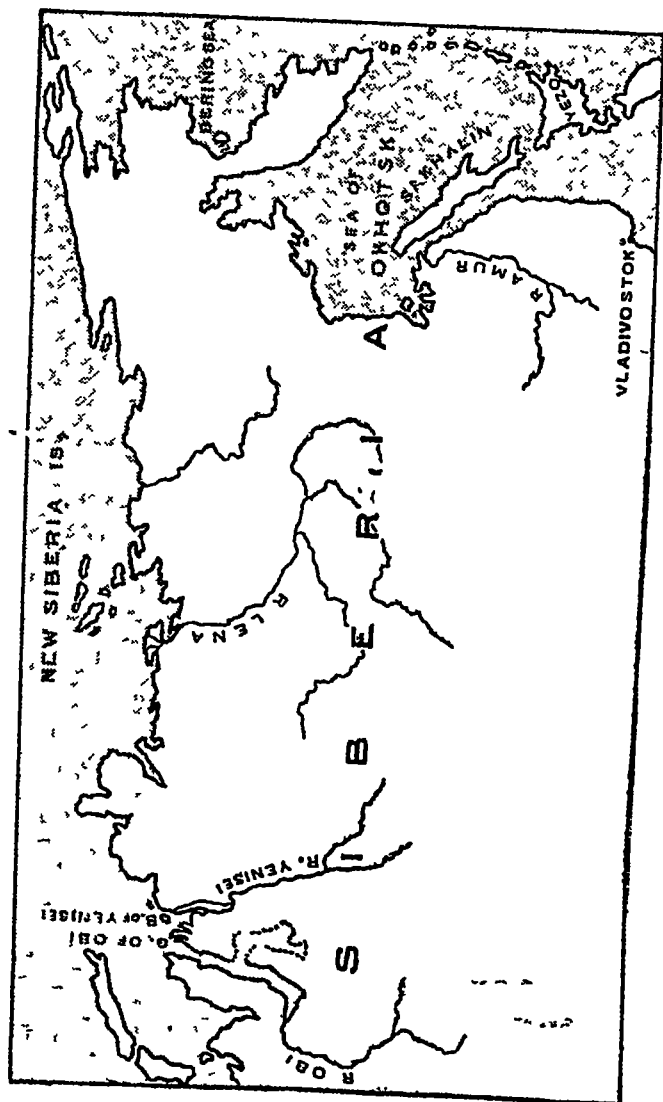
openings into the land, and tiny islands almost without number.

(We pass the **Island of Formosa**, and are then in the **East China Sea**.) Find out from the map the name of the chain of small islands which bounds it. (These islands, as well as Formosa, belong to Japan.) The East China Sea, and its big bay, the Yellow Sea, are very shallow, and are being slowly filled up by the mud brought down by the Yangtse-kiang and the Hwang-ho, the two rivers which flow through the most fertile part of China.)

Let us sail round the shores of this sea. (We come to the **Shan-tung peninsula**. At the point of the peninsula is the British port of Wei-hai-wei, while across the strait, is Port Arthur, which belongs to Japan. Into the Gulf of Chi-li flows the Pei-ho river, on which stands Pekin, the capital of China.)

Notice (the peninsula of **Korea**.) It divides the East China Sea from the **Sea of Japan**. The Japanese carry on a large fishing industry in the Japan Sea, for, as we have been travelling north, it has been getting cooler, and the water near the shores of this sea is shallow.)

(We also see the effect of the change of climate in the appearance of the coasts. Instead of shores green with vegetation and busy with trade, we



Coast-line of Siberia

begin to find barren beach or rock with very few towns or villages. Most of the coast of Siberia is desert, not from excess of heat and lack of rain, as in Arabia, but from the intense cold

(The coast is very rocky, until we reach the mouth of the **Amur**, which flows into the strait between the island of **Sakhalin** and the mainland. The mouth of this river is frozen for about half the year. Beyond the strait, is the **Sea of Okhotsk**,) which is like the East China Sea in one respect, for it is bounded by a large peninsula and a chain of small islands. But it is very different in another way. (its shores are bleak and barren, and its climate very cold.)

(The last inland sea is the **Bering Sea**, with its seal and whale fisheries and its icebergs,) but this sea belongs as much to America as to Asia; and the island chain which encloses it does not belong to Asia at all

(The northern coast of Asia is,) as we have already seen, (very cold, and for the greater part of the year icebound. The only features which you need remember are the **New Siberia Islands**, on which fossil ivory, from the tusks of the now extinct mammoth, is found, and the estuaries of the **Obi** and **Yenisei**, which can be reached by ships from the Atlantic Ocean during the few weeks of summer.) Find these features on the map.

Questions.

1 How does the coast-line of the south-east of Asia differ from that of the south-west?

2 Account for the great trade of the ports of Singapore, Hong-Kong and Shanghai

3 Why has the Arctic Ocean no commerce? Name the Siberia rivers which fall into this ocean

4 On an outline map, write the names of the gulfs and seas, the chief straits and islands, and the largest ports on the east coast of Asia

5. By means of the scale on the map in your atlas, find the distance by sea (a) from Rangoon to Singapore, (b) from Singapore to Hong-Kong, and (c) from Hong Kong to Shanghai

CHAPTER III :—THE SURFACE OF ASIA.

Examine a physical map of Asia, and find on it the chief surface features, as follows :—

1. **The great plain of the north.**

2 **The belt of high land**, south of the plain, stretching from the Mediterranean Sea to the Pacific Ocean.

3. **The river plains** on the east and south of this mountain belt

4 **The table-lands of Arabia^{valley} and the Deccan.**

These are the great physical divisions of Asia, and we may study each of them in order

I. The Great Plain.

(This, as we have already seen, stretches across Europe as well as Asia, and is widest along the border between the two continents.) What is the shape of the Asiatic portion ? (Find the Caspian Sea, and from it draw two lines, one due north, and the other north-east to Bering Strait. These two lines and the coast of the Arctic Ocean enclose the great plain : it is a vast triangle.)

The direction of the rivers shows the slope. The greater portion slopes towards the Arctic

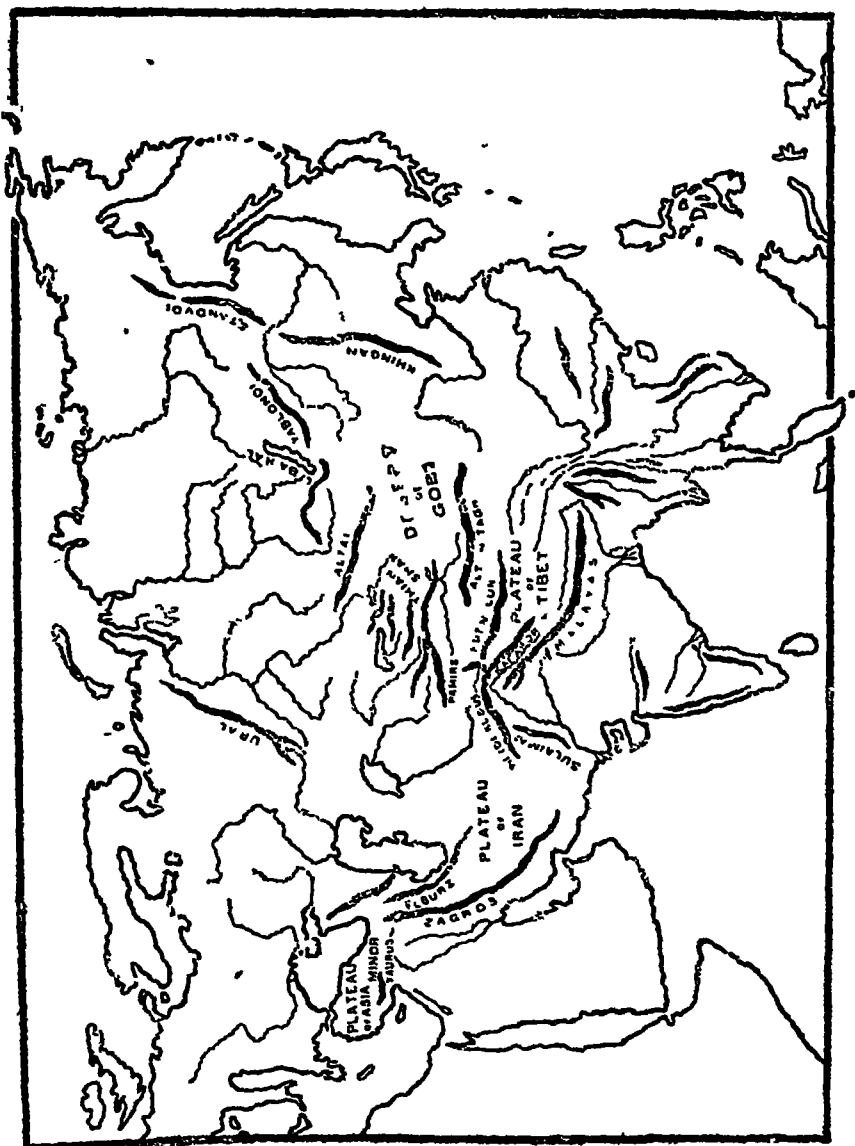
Ocean, but in the south-west the slope is towards the Caspian Sea, the surface of which is actually below sea level. The slope of the whole plain is, however, very gentle, and the rivers flow very slowly, that is, when they flow at all, for they are frozen over for weeks and months together. (Even when the ^{rest of the world's rivers} ~~upper~~ courses are flowing, the ~~lower~~ ^{lower} courses are blocked with ice.) This, and the slow rate of flow, cause the rivers to overflow in many places, and large ^{swamps} ~~swamps~~ are formed. You can imagine, therefore, how difficult it is to travel about. The rivers are sometimes useless for this purpose on account of the ice, good roads are absent, and there is only one railway line. In the south-west travelling is easier. There are more railways, and the roads are better.

II. The Mountain Belt.

This belt, as you see from the map, is narrowest in the centre. It is not very broad in the western half, but to the east it widens out, until it stretches from Bering to the Malay Peninsula.

Find the **Plateau of Pamir** to the north-west of India. It is a mass of elevated land with mountains rising above it. The Plateau of Pamir may be said to be the centre of the highlands of Asia, for they all seem to meet there.

Let us examine the western highlands first.



Find the '**Plateau of Iran**', and, to the west of it, the **Plateau of Asia Minor**. *آسیا صغیر*

The Plateau of Iran is like a saucer. It is low in the centre, and has a rim of mountains round it. The central portion is about 3,000 feet above the sea, but some of the mountains round the rim are very lofty. Trace on a large map the **Hindu Kush**, and the **Elburz Mountains**. These form the northern edge of the plateau. The **Sulaiman Mountains** and the **Kirthar Range** bound the plateau on the east, and the **Zagros Mountains** run along the south parallel to the Persian Gulf. You will see from the map that the Plateau of Iran includes *Persia, Afghanistan, and Baluchistan*. Most of the plateau is desert, and the roads are poor. Trade is carried on by means of caravans of camels.

The Plateau of Asia Minor is highest in the east, and slopes towards the west. The **Taurus Mountains** border this plateau on the south.

Now let us return to the Plateau of Pamir. Trace the following ranges on the map.

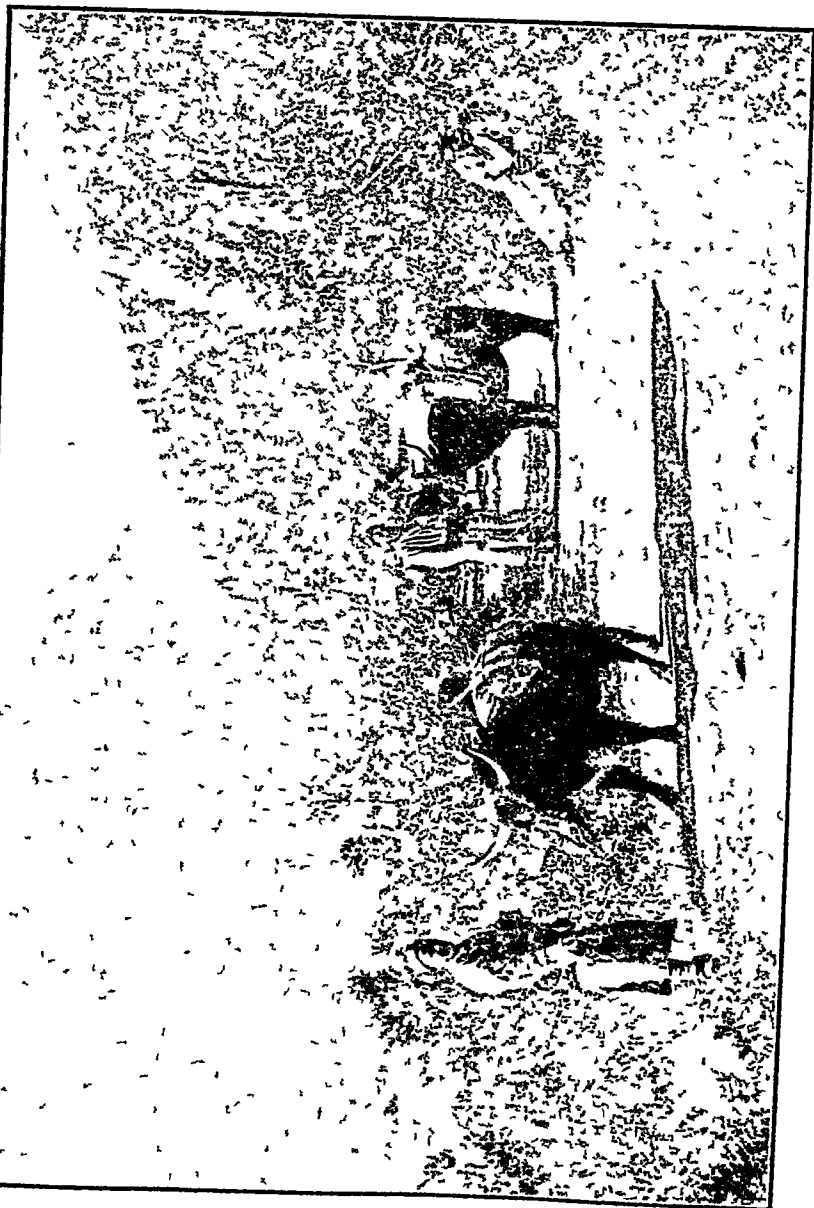
1. The **Thian-Shan** and the **Altai Mts.**, extending north-east to **Lake Baikal**.
2. The **Kuen-lun Mountains**, which go due east into China.
3. The short but lofty **Karakoram Range**, north of Kashmir.

4. The **Himalaya Mountains**, to the north of India, really two main ranges, with the valley of the Sanpo or upper Brahmaputra between them.

These may be called the Central Highlands of Asia; they form the most elevated region on the surface of the Earth, and contain the highest peaks. The region includes two plateaux, one to the north of the Kuen-lun Mountains which is not very lofty, and the other to the south of the same range, the **Plateau of Tibet**, which is nowhere much less than three miles above sea level.

How hard must the life of the Tibetan be! His country is shut in by lofty mountains, so he is cut off from the rest of the world; cold, dry winds blow nearly all the year, and very little rain falls, so only in the most sheltered valleys can trees grow or crops be raised. The things which he requires from other countries or sends to them, are carried along difficult roads and over high passes, on the backs of yaks, the most common beasts of burden in this region.

Let us now turn to the Eastern Highlands. From Lake Raikal you can trace the **Yablonoi** and the **Stanoyoi Mountains**, as far as Bering Strait. South of the Altai and the Yablonoi Mountains, is the **Plateau of Mongolia**, sometimes called the **desert of Gobi**, which is bounded on the east by the **Khingan Mountains**.



Loaded Yaks on the Tibet Road

(The surface of the south-eastern portion of the Chinese Empire is very irregular, and there are many hills and low mountain chains,) of which you need not learn the names (In the fertile valleys flow the tributaries of the great rivers of China, and the splendid crops grown in the river valleys and on the mountain slopes support a vast population) -

The mountains of the peninsula of Indo-China run in parallel ranges from north to south. If you look at the map, you will see that the eastern end of the Plateau of Tibet seems to break into ridges and to turn sharply to the south. Trace the ranges on the map. The first runs between the *Brahmaputra* and the *Irrawaddy*, the second between the *Irrawaddy* and the *Salween*, the third between the *Salween* and the *Mekong*, and the fourth between the *Mekong* and the sea. Which of these ranges runs down into the Malay Peninsula?

III. The River Plains.

We shall study the rivers of Asia in the next chapter, but in the meantime you should look at the map and see how many rivers have brought down soil from the mountains and built up plains in their lower courses.

Find two important river plains in China, two in Indo-China, and two in India. There is another

plain between the Plateau of Iran and Arabia. Name from the map the rivers which have built up these plains. Most of them are very fertile and support a large population. Notice that the **Plain of Mesopotamia**, like the lower plain of the Indus, lies between two deserts. These two plains require the help of irrigation to make them fertile.

IV. The Southern Table-lands.

The **highlands of Arabia** and the **Deccan** are different from those of the rest of Asia. They are true tablelands, that is to say, their surface is fairly flat at the top; there are no great mountains rising above them, as in Tibet or the Plateau of Pamir.

Questions.

- 1 Describe the great plain of Northern Asia.
- 2 Where in Asia are there ~~fertile~~ river plains? Name the rivers which flow through them.
- ✓3 On an outline map, insert the great mountain ranges of Asia, with their names. Keep this map until you have read the next chapter.

CHAPTER IV.—THE RIVERS OF ASIA.

Look at the map on page 28. There are four kinds of shading. One includes the basins of rivers which flow into the Arctic Ocean, another those which flow into the Pacific Ocean, a third those which fall into the Indian Ocean, and the fourth those which never reach the ocean at all. Let us take these in order.

1. Rivers flowing into the Arctic Ocean.

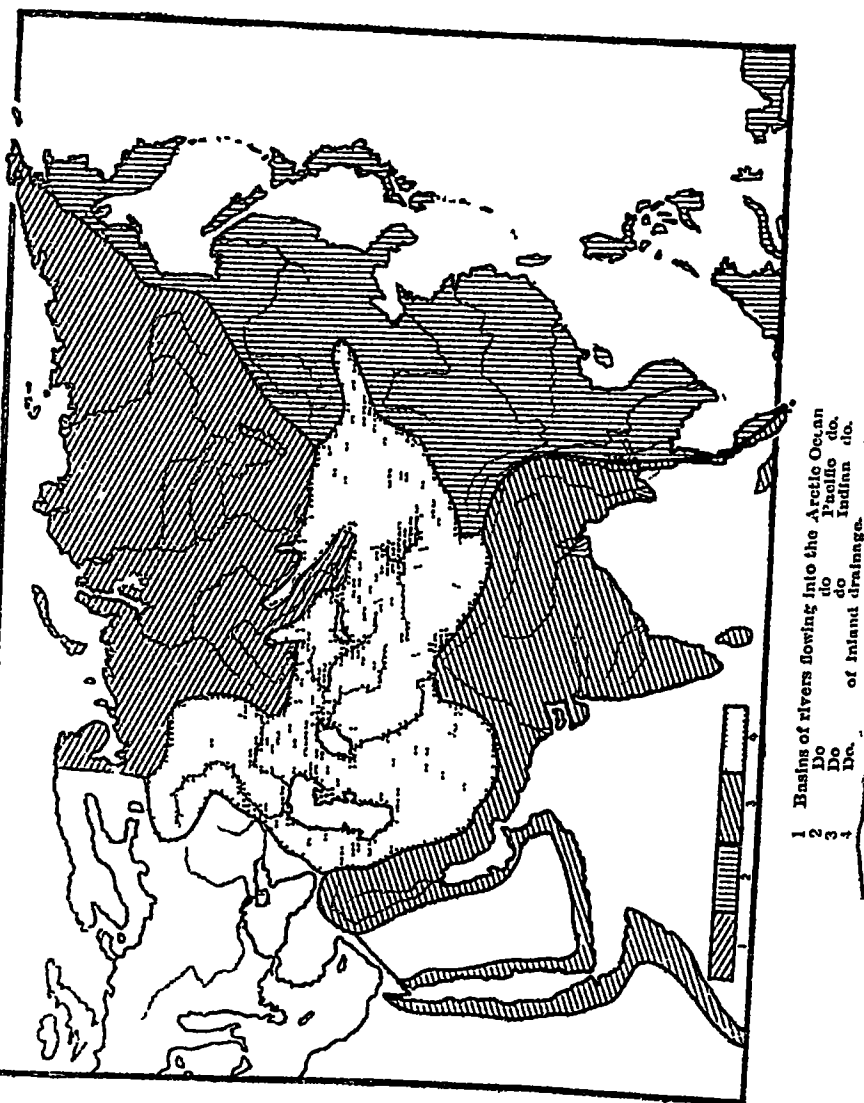
(There are three great rivers in Siberia.) Find out their names from the map. (The lower courses of these rivers are, as you have learned, rarely free from ice, towards the north, therefore, they are of little use. But further south they are quite useful. Here the climate is not so cold, and in the river valleys much wheat is grown.)

(Notice Lake Baikal in the basin of the Yenisei. It is the largest fresh water lake in Asia,) and it is very deep. Its surface is frozen for several weeks in winter.

2. Rivers flowing into the Pacific Ocean.

Trace on the map the courses of the **Amur**, the **Hwang-ho**, the **Yangtse-kiang** and the **Si-kiang**. They flow with a general direction to the east.

The Amur rises in Mongolia, it then forms for

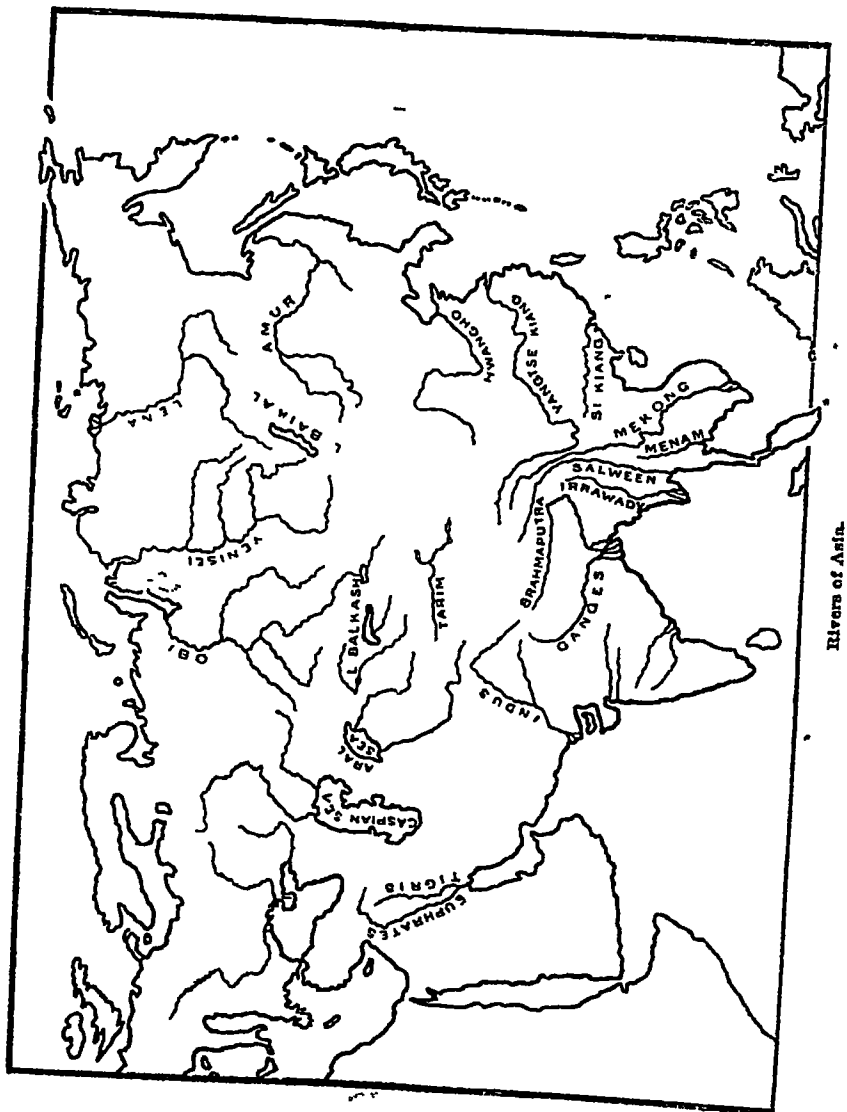


hundreds of miles the boundary between Mongolia and Siberia, and finally becomes a Siberian river. In its long mountain course it is of little use, but it waters a large plain in its lower stage, which is also used for boat traffic for the half of the year, when it is free from ice.

The Hwang-ho flows through the famous yellow-earth region of northern China. Its course is too rapid, and in some places it is too shallow for boats, but it provides water and fertile soil for one of the most thickly peopled plains in the world. It is very liable to floods, especially near the mouth. The Chinese could show you nine different channels, by which the river has at one time or another flowed to the sea. (Every time it has burst its banks and changed its course, it has caused terrible destruction), and it is therefore called 'China's sorrow.'

(The Yangtse-kiang is the longest river in China. It rises in the centre of Tibet. It, too, provides the means of support for a vast population, but it is as a highway for trade that it is chiefly noted. With its tributaries and canals, it forms the busiest net-work of waterways in the world.)

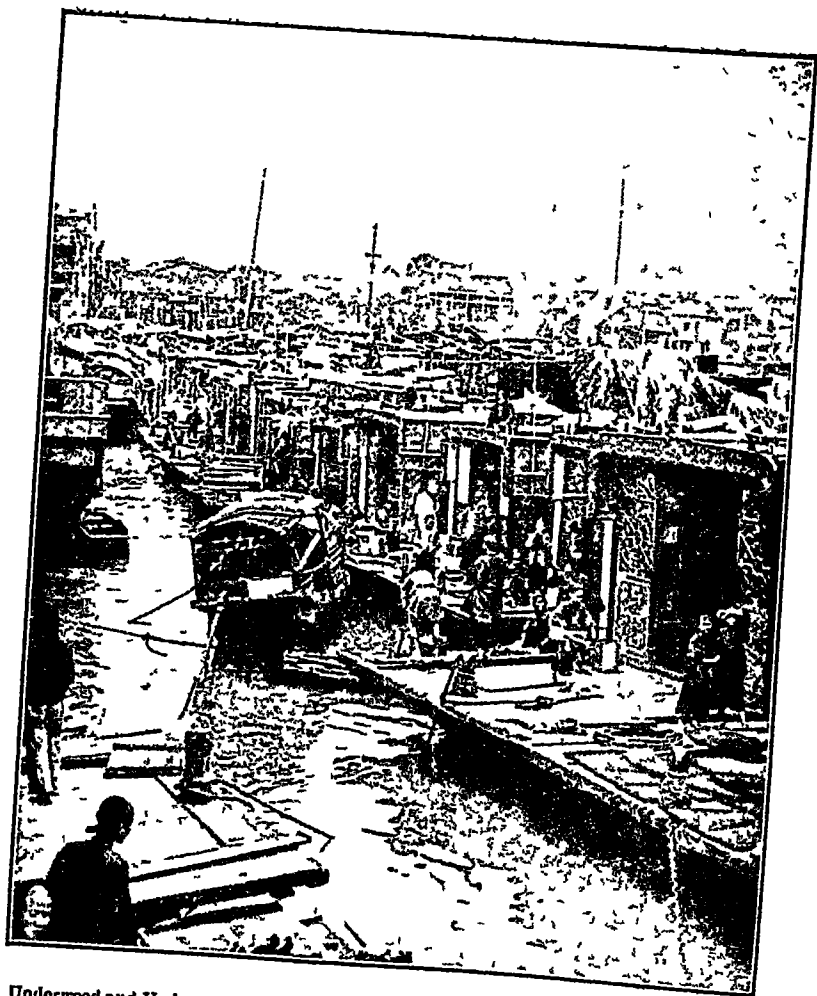
The Si-kiang is less important than the other two Chinese rivers which we have mentioned, but it has the large port of Canton on one of its mouths. Many thousands of people in Canton live in boats on the river.



The two rivers of Indo-China which flow into the Pacific Ocean are the **Me-kong** and the **Me-nam**, the former rising far away in Tibet, the latter a short stream. Look at the map, and find out what countries are separated by the Me-kong. The mountain stages of both these rivers flow swiftly through dense mountain forests which are little known, but the coast plains which they have built up are very fertile and thickly populated.

3. Rivers flowing into the Indian Ocean.—With the exception of one river—the **Shatt-el-arab**—these all belong to the Indian Empire. Name, and trace on your atlas the courses of the two rivers of Burma, the three rivers of the plain of Northern India, and the rivers of the Deccan. The Shatt-el-arab is formed by the union of the **Euphrates** and the **Tigris**, which rise in the highlands of Armenia. Notice that the former has no tributaries. (Agriculture in this region requires irrigation by canals.) The remains of ancient canals may still be seen in Mesopotamia. Some day they may be restored, and the land be made prosperous once more. River steamers travel as far as *Baghdad* on the Tigris, but there is very little trade on the Euphrates.

4. Rivers of Inland Drainage.—These rivers are found both on plains and on plateaux, but they are always due to the same cause; their



Underwood and Underwood.

House boats at Canton.

basins lie in depressions, from which the land rises on all sides.

Find on the map the plateau between the Thian-shan and the Kuen-shun Mountains. There you will find a river, the **Tarim**, which is longer than the Ganges. It rises in the Plateau of Pamir and flows into a lake, ^{Lob-nor} with swampy shores, called **Lob-nor**. It is only a fine river in the summer, when the mountain snows melt. At other times, its course is in many places quite dry. Notice on the map other rivers of inland drainage flowing into the *Caspian Sea*, the *Aral Sea*, and *Lake Balkash*.

Questions.

- 1 Why are the rivers of Siberia of little use?
- 2 Which rivers of Asia support a large population? Why?
- 3 ✓ Compare the valley of the Tigris and Euphrates with that of the Indus. Why is the latter more productive?
- 4 Name from the map some rivers in Asia which do not reach the ocean. Into what seas or lakes do they drain?
- 5 On the outline map, on which you drew the mountains of Asia, show the courses of the chief rivers.
- 6 Arrange the following rivers in the order of their length —Obi, Yangtse-kiang, Hwang-ho, Ganges.

CHAPTER V —THE CLIMATES OF ASIA

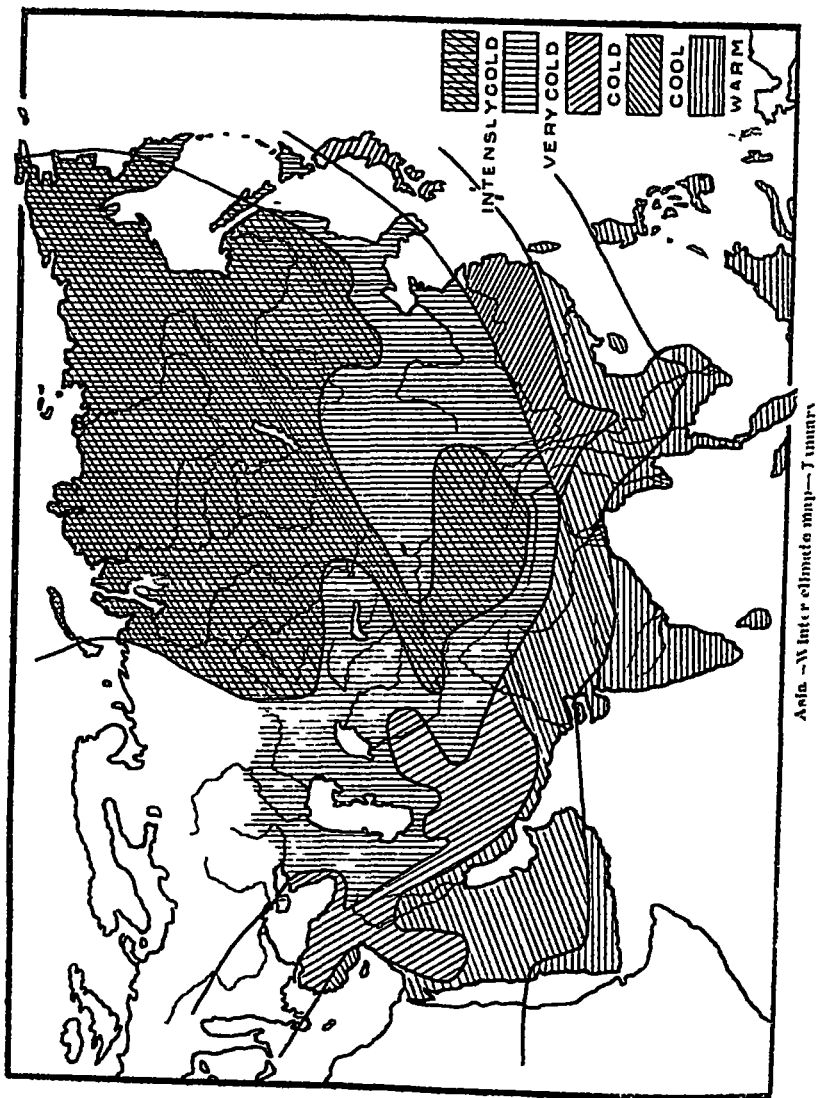
You will notice that in the title of this chapter the word 'climates' is used, and not 'climate,' and the reason will soon be quite plain to you, for we shall see that in different parts of the continent there are very different climates ; in some places it is sometimes very hot, in others it is very cold, in some it is wet, in others it is dry. We shall find it convenient to study the climates of Asia in six regions, as follows —

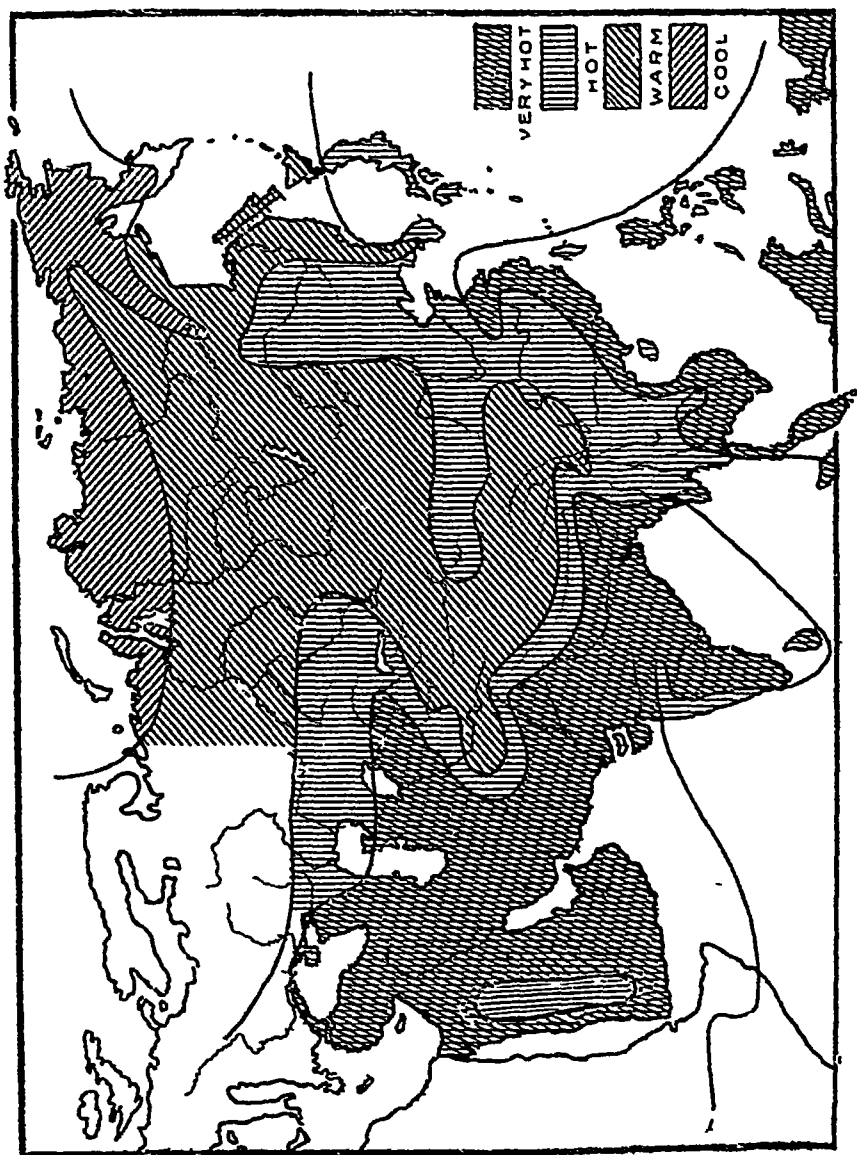
1. Siberia.—Trace the boundaries of this region on the map in your atlas. It consists of all the lands to the north of the great plateau and mountain ranges. As regards heat and cold, this is a region of extremes, the summers are short and mild, and the winters long and very cold. But what is the rainfall ? In the winter, the winds blow towards the warmer regions of the south, and hence they are dry. There is little or no winter rainfall in Siberia. The moisture that is deposited takes the form of snow. But in summer, the centre of Asia is hot, and the winds blow in from the ocean, bringing moisture with them. The winds from the Indian Ocean lose their rain on the great mountain ranges, which border Tibet on the south—they give no rain to Siberia ; but the winds of the Pacific

Ocean and those of the Atlantic which blow across Europe, have no such great mountains to cross, and so they bring rain to Siberia. So also do the winds from the Arctic Ocean, for we must remember that in the summer much of the ice in that ocean melts, thus enabling the wind which blows over it to take up moisture. The north of Siberia, however, does not get nearly so much rain as the south, where there is more highland to condense the moisture. Briefly, then, we may say that Siberia has an extreme climate, with mild summers and very cold winters, and that it has a fair summer rainfall, which increases in amount from north to south.

2. The Central Highlands.—This region includes all the high mountains and plateaux, from India on the south to Siberia on the north, and from Afghanistan in the west to China in the east. Here, too, the climate is extreme, mild in summer and very cold in winter. It gets very little rain at any time of the year, for, although the winds blow inwards from the sea in the summer, they lose most of their moisture when they reach the mountain ranges, which surround the plateau on all sides. Thus the Himalayas get good monsoon rain in summer, but when the winds reach Tibet, they are quite dry.

3. The Western Plateaux.—This region includes Baluchistan, Persia, Arabia, and the



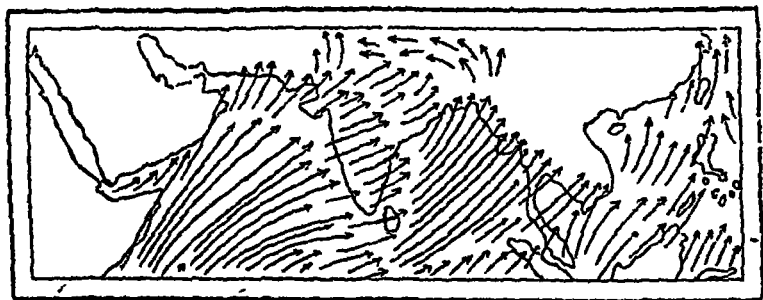


Asia—Summer climate map—July

elevated part of Asia Minor. Here the climate in winter is pleasant, but the summers are very hot.

4. The Monsoon Region.—This region extends over the whole of south-eastern Asia, and includes India, Indo-China, China, and the southern part of Japan. You see from the climate maps on pages 36 and 37 that it is everywhere hot in summer, but the climate in winter varies according to the latitude, from warm in South India and Indo-China to very cold in North China.

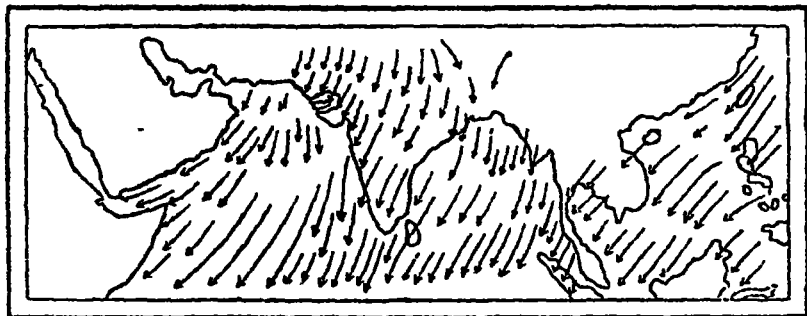
But the most important thing about the climate of this region is its rainfall. In studying the climate of India, you learn that it gets most of its rain from the south-west monsoon winds, which blow during the summer. The same may be said of



S-W Monsoon

the whole of the monsoon region. From the west of India right round to the north of Japan, the rainfall is heavy in summer. In the winter, however, the north-east monsoon does not give so much

rain. Only the coasts which face the east, for instance, the Madras coast in India, and the east coast of China and Indo-China, get a good supply



N -E. Monsoon

5. **(The Mediterranean Region).**—Look on the globe or the map of the world, and find the Mediterranean Sea. It has a climate of its own. It is enclosed by Europe on the north, by Africa on the south, and by Asia on the east. Only a small part of Asia borders this sea, but this part has a Mediterranean climate. It is always mild and moist, on account of its nearness to the warm sea, and, unlike most of the rest of Asia, it has winter rain. In the summer, the winds from this region blow towards the vast, hot Sahara desert, so they blow away from southern Europe and Asia which are then dry, but in winter the winds come from the west and bring rain. You should remember that, not far from the coast, the plateau begins to rise, and it therefore gets drier

as we travel inland, until we come to the desert. The Mediterranean region in Asia, then, is really very small. It consists of the coast lands which border the Mediterranean Sea.

6. The Equatorial Region.—Only a few islands to the south-east of Asia lie along the Equator. In these the climate is always hot, and heavy rain falls at all seasons of the year.

Questions.

1. In what parts of Asia does rain fall (a) in summer, (b) in winter?

2. What do you mean by a Mediterranean climate? Describe it.

3. Compare the difference in climate between Assam and Sind with the difference between Indo-China and Arabia.

CHAPTER VI.—THE COUNTRIES OF ASIA.

In learning about the countries of Asia, we may begin with those which lie to the south-east of India, and proceed round the east, north, and west of the continent, finishing up with those which border India on the north-west.

1. The East Indian Islands.

These islands are arranged in three groups. Find them on the map.

1. The curved chain in the south, from Sumatra to Timor. These all belong to *Holland*, except the eastern portion of Timor which belongs to *Portugal*. Find Holland and Portugal on a map of Europe.

Java is by far the most important island. It is only one-third the size of Sumatra, but it contains five-sixths of the population of the whole group.

2. The central group includes Borneo, Celebes, and the Moluccas or Spice Island. These, again, are Dutch possessions, with the exception of the north-west portion of Borneo which is British.

3. The Philippine Islands, are in the north. They belong to the United States of America.

Luzon is the largest of this group of more than 400 islands

Observe from the map that the East Indian Archipelago is almost bisected by the Equator; all the islands lie in the Torrid zone, where there is great heat and good rainfall. This accounts for the dense forests on the mountains and the abundant crops on the coast plains. The forests supply timber, and the plains every kind of tropical produce.

Where vegetation grows in such abundance, the needs of the people are supplied with but little effort on their own part; hence the natives of the East Indies, like those of other equatorial countries, are generally lazy and uncivilized. In the forests, there are still wild tribes with which the rulers hardly come into contact at all, but round the coasts, the people are learning habits of industry, and are making progress.

The chief town of the Dutch islands is Batavia, a busy port and the seat of the Government. The capital of the Philippine Islands is Manila, a port, with a population equal to that of Delhi. There is no large town in the central group of islands.

Questions.

- 1 Describe the life of the people in the East Indies
- 2 On an outline map, write the names of the largest islands in the East Indies, and the two chief ports

2.—Indo-china.

Examine the peninsula of Indo-China on the map. You will see that it consists of a land mass, ending southwards in three capes, Cape Negrais, Cape Romania, and Cape Cambodia. The central peninsula is long and narrow. It is called the Malay Peninsula.

Find Siam, and trace its boundaries. There is a compact portion to the north, and a narrow strip running down the Malay Peninsula. Siam is the only independent state of Indo-China. It is ruled by its own king. To the west of Indo-China, and at the southern end of the Malay Peninsula, the territory is either *British* or under British protection; that to the east belongs to *France*.

British Indo-China.—The geography of Burma is included in your study of the Indian Empire, so we need only consider the territory at the southern end of the Malay Peninsula. Here there are British possessions and native states. Find (the islands of Penang and Singapore, and the small district of Malacca) on the mainland. These belong to great Britain; they are called the Straits Settlements, because they lie on the Straits of Malacca. The remainder of the mainland contains four native states, called the Protected Malay States. The centre of the country is

mountainous and covered with forests, but the rubber-tree is extensively cultivated,) and rubber worth more than ten crores of rupees is exported yearly. The whole peninsula is famous for its tin mines. Half the world's supply of tin is produced here, the value of the metal exported annually being more than fifteen crores of rupees.

The chief towns are **Singapore** (see page 12) and **Georgetown**, on the island of Penang. Both are important ports.

Questions.

- 1 Which parts of Indo-China belong to the British?
- 2 What is the principal mineral product of Indo China? Where is it chiefly obtained?
- 3 "The growth of Singapore is due to its position" Explain this

3.—The Chinese Empire.

Trace on the map the boundaries of the Chinese Empire, and say what countries lie to the south, west, and north of it. Notice that the land boundaries are generally mountainous, in many places they cannot be crossed. This has prevented the Chinese from coming into contact with their neighbours, and has had a remarkable effect upon the history of the country. For many centuries the people of China were very jealous of foreigners, and

would not allow them to live peaceably in the country. Only recently has a change begun to take place

Find the five divisions of the Empire—**China Proper** (to which the name China is usually given). **Manchuria**, **Mongolia**, **Sin-kiang** or **Chinese-Turkestan**, and **Tibet** Together, they cover an area more than twice as large as India, or a quarter of the whole continent

China Proper—(This is the south-eastern division) Its area is somewhat less, but (its population rather more than that of the Indian Empire). Eleven-twelfths of the people of the Chinese Empire live in China Proper. How do you account for this? The climate, the fine river system, the wonderful fertility of the soil, and the industry of the people combine to make it one of the most productive regions in the world.

(The soil in the north of China is everywhere remarkably fertile) The Chinese are very good farmers: they work very hard in their fields and cultivate every piece of land they can, raising sometimes as many as three crops from the same ground in a year.

(The most important crop, as in other parts of the monsoon region, is rice, next in importance, are sugar, cotton and tea) China was formerly the greatest tea-producing country in the world, but its

export has declined since India and Ceylon began to grow the plant on a large scale

The people belong to the Mongolian or yellow race. The Chinaman has a yellowish skin, black straight hair, slanting eyes, a small nose, and little or no beard. People of this type occupy not only the Chinese Empire, but also the greater part of Indo-China, Japan, Siberia, and portions of south-east Asia.

There are many large cities in China. Find the following on the map. (Pekin is the seat of Government. It stands on the Peiho.) Forty miles from the mouth of the river, is (Tientsin), the port of Peking, which has a larger population than the capital. Many important towns stand on the banks of the Yangtse-kiang. This river is a great highway for trade, and it has therefore several river-ports. Shanghai stands on one of the mouths, twelve miles from the sea. The passage of ships is not easy, but it is nevertheless the chief port of China, for it receives the produce of the rich valley of the river. Many European firms are established here. One hundred and fifty miles up the river is Nan-kin, the former capital, with a flourishing silk industry. Proceeding up the river, we reach Han-kow, the second town in China in point of population. Large steamers can reach this place, a distance of 680 miles from the sea. Canton.

on the Si-kiang river, is the most populous town, and the second port in China. It is as large as Calcutta

(**Manchuria** lies outside the monsoon region, and further north than China Proper, its climate therefore is not so mild, and the crops are not so abundant Agriculture is, however, improving, and the country is making progress The capital, **Mukden**, is on the railway running north from **Port Arthur** to the great Siberian Railway.) Mukden has a population of 160,000, or a little less than that of Allahabad.

Mongolia. (~~Next to China Proper~~, Mongolia is the largest division of the Empire, but it has a very small population) The whole province has only about twice as many people as the city of Calcutta You can probably account for this. (The country is nearly all desert, and the people are mostly wanderers, who travel about with their camels, horses and sheep in search of pasture)

Si-Kiang or Chinese Turkestan includes that part of the empire which lies between Mongolia on the north and Tibet on the south. Like Mongolia, it is mostly desert with a scanty, wandering population.

(**Tibet** is another cold desert.) Owing to its harsh climate, and to the difficulty of reaching the country through the mountain ranges which surround it,

China has but little control over it. The chief power is in the hands of the Dalai Lama (the Buddhist high priest) and the monks. The people are very backward, and do not allow foreigners to cross their borders, hence large areas in Tibet are still unexplored. Lhasa is the capital.

Questions.

- 1 How do you account for the backward state of the Chinese Empire?
- 2 Describe the life of the people of (a) Mongolia, (b) Tibet
- 3 Account for the great population of China Proper
- 4 Describe the course of the Yangtse-kiang, and mention some river-ports on its banks
- 5 Account for the position of Shanghai, Hankow, and Canton
- 6 The area of China Proper is about 1,530,000 sq miles, and its population 302,000,000. The area of Tibet is 450,000 sq miles, and its population 2,000,000. Find the average population per square mile for these provinces. Account for the difference.

4.—The Japanese Empire.

Find on the map the group of islands which encloses the Sea of Japan. There are four large islands, and many smaller ones. You should learn the names of the large islands, they are **Hondo**, **Yezo**, **Kiu-shiu**, and **Shi koku**. This group of islands is Japan proper. But the empire is of

much greater extent To the north, it includes the **Kurile Islands** and the southern half of Sakhalin, to the west the peninsulas of **Korea** and **Port Arthur** on the mainland, and to the south the **Lu-chu Islands** and **Formosa**. So you see that nearly the whole of the island chain to the east of Asia belongs to Japan, whose territory extends over nearly thirty degrees of latitude

(With so great a length, you naturally expect the climate to vary from north to south Hondo and Korea and the islands to the south are warm, Yezo and the islands north of it are colder, but their climate is improved by the warm ocean current, which flows northward along the coast from the Equator.)

(The island chain is mountainous and volcanic Earthquakes are so common that the people have become quite used to them. They build then houses of wood or bamboo, which cannot be much damaged by the Earth-movement The most famous volcano is **Fujiyama**, over two miles high; it has been inactive for more than 200 years

(As so much of the surface of Japan is mountainous, only about one-tenth of the total area can be cultivated, but the Japanese, like the Chinese, are very good farmers, and their industry, aided by the climate, makes the land very productive.) Here, again, the chief crop is



Underwood and Underwood

Fujiyama

rice. Tea is another very important product, and the amount of raw cotton and silk obtained in the country is sufficient to give rise to weaving industries on a large scale. Fishing and mining occupy a large number of people. The Japanese fisheries are among the most productive in the world. Fish is one of the most important articles of food.)

(The Japanese people belong to the Mongolian race like the Chinese, but, as they live on islands which can be easily reached by foreigners, they have made much more rapid progress than their neighbours on the mainland. They have started many factories, and cotton and silk goods are exported. The presence of sulphur from the volcanoes and of timber in the forests, has given rise to the match industry, and paper of excellent quality is made. The Japanese are very skilful and artistic in making ornamental articles of all kinds, whether of metal, wood, china, ivory, silk or paper. These goods are much admired by the people of other countries.)

In an empire of mountainous islands like Japan, where would you expect to find the chief towns? They are situated on or near the coast. Find the following towns on the map :

Tokyo, the capital, stands on a fertile plain in the south-east of the island of Hondo. It has a

population of about 20 lakhs. Its port, **Yokohama**, is eighteen miles away. Fifty years ago, Yokohama was a small fishing village. It now has half the shipping trade of the whole empire. The second port is **Kobe**, through which passes one-third of the commerce of Japan. The capital of Korea is **Seoul**. Formerly a very unattractive town, it has been greatly improved since the Japanese began to rule the country.

Questions.

1. What islands and groups of islands belong to the Japanese Empire?

2. Describe the climate of the islands (a) in the south, (b) in the north.

3. Which of the raw products of Japan are manufactured in the country?

4. Why are the Japanese people more advanced than the Chinese?

5. Give the names of the chief Japanese ports, and say what is exported from them.

6. On an outline map, insert the chief towns of Japan. Write also the names of the chief islands and the large peninsula on the mainland which belongs to Japan.

7. Measure on the map of your atlas the length of the chain of islands which make up the Empire of Japan, and from the scale find out the length in miles.

8. The area of the Japanese Empire is 160,000 square miles and its population 53 millions. What is the average population per square mile?

5. Asiatic Russia.

The Russian Empire in Asia is divided into three parts—Siberia in the north, Russian Central Asia in the south-west, and further west, Trans-caucasia, the Russian territory on the Asiatic side of the Caucasus Mountains

(Asiatic Russia possesses great natural wealth, and the population in many parts would certainly increase if this wealth could be made use of. The forests have vast supplies of tumber, large areas could be made to produce good crops of wheat and other food-grains, and there are valuable minerals in the eastern highlands. What the country needs are more roads and railways. It is of little use for people to cut down timber, to dig minerals, or to grow wheat, if they have no means of carrying them rapidly to other places after they have been obtained. At present, goods have to be carried for many miles to the railway by means of caravans along the roads, barques on the rivers, and sledges over the snow and ice. These methods of transport are both slow and costly.

The most important towns are on or near the railway Vladivostok, on the Pacific Ocean, is the terminus of the Great Siberian Railway. Its population has increased threefold in the last twenty years. The harbour is frozen in winter,

but the ice is broken by ironclad steamers, and the port is thus kept open all through the year Irkutsk is an important railway station and a beautiful city, forty miles west of Lake Baikal. It is the largest town in Eastern Siberia. Tomsk, on a branch line, is the chief town of Western Siberia. It possesses the only university in Asiatic Russia.

Look on the map and find Baku on the Caspian Sea, and Batum on the Black Sea. A railway joining these two ports runs across Transcaucasia. The chief product of this province is mineral oil, which is found round Baku in greater abundance than in any other locality in the world. The oil is sent to Europe from Batum.

Questions.

1 What natural products in Asiatic Russia are waiting for the means to develop them? *minerals, etc.*

2 Name the chief towns in Asiatic Russia and state an interesting fact about each.

3 From the scale on the map in your atlas and the length of the railway route from Vladivostok to Petrograd

✓ 4 Account for the growth of (i) Vladivostok, and (ii) Baku.

6. Countries of the South-western Peninsulas.

To the south-west of Asia lie the two large peninsulas of **Asia Minor** and **Arabia**.

With the exception of the small but important British possession of **Aden** in the extreme south-west, the two peninsulas are divided between (i) **Turkey in Asia** and (ii) the independent countries of **Arabia** and **Oman**.

(i) Turkey in Asia.

Find the following divisions on the map ; (1) **Anatolia** or **Asia Minor** (2) **Syria**, between Asia minor and Arabia ; (3) the **coast strips** of the Red Sea and Persian Gulf ; and (4) **Mesopotamia**, the valley of the rivers Euphrates and Tigris after they leave the plateau of Armenia

Anatolia is nearest to **Europe** and is the most advanced province ; but even here progress has been slow. Agriculture is the chief industry ; maize, cotton and fruits are grown along the coasts and in the river-valleys. Fishing occupies a large number of people ; you have already read of the great sponge fishery of the **Levant**.

Syria consists of a desert, with a small and wandering population. The large caravan centres of **Damascus** and **Aleppo**, are connected with **Beirut**, the largest port on the Syrian coast.

The western portion of Syria, near the sea, which includes **Palestine**, the home of the Jewish and Christian religions, has a more genial climate. Here the people are more settled and live in towns and

villages The chief products are fruit and tobacco. In this part of the country, the most important towns are **Jerusalem**, for many centuries the capital of the Jewish nation, and **Jaffa**, its port, renowned for its oranges.

The Red Sea coast of Arabia and the Persian Gulf coast strip are of little commercial importance, for they lie on the edge of the desert. Part of the western coast possesses great interest as being the birthplace of Islam, whose founder was born at **Mecca**, and died and was buried at **Medina**, 200 miles further north. These places, specially the former, are visited by large numbers of Muhammadan pilgrims every year, which makes the port of **Jeddah** very busy.

Mesopotamia, the valley of the Tigris and Euphrates, was formerly much more important than it is now. The ruins of splendid cities can still be seen, and also the remains of old canals, which show how the valley was irrigated and cultivated in past ages. Now the country has fallen into decay, and is inhabited chiefly by wandering tribesmen. The largest towns are **Baghdad** and **Mosul**, which are important centres for caravan routes. Goods are brought from the interior to the river-banks on the backs of camels; they are then carried in boats to **Basra** for export.

(ii) Independent Arabia.

This territory includes the whole of the central portion of the peninsula of Arabia, from the Syrian Desert on the north, to the Indian Ocean on the south.) In structure, it consists of a vast desert plateau—stony in the north, and sandy in the south. The area of independent Arabia is one-third that of the Indian Empire, but the total population is under five lakhs, or less than that of the city of Madras. There are wide tracts of country which are never visited by a human being. On the oases date-palms flourish, and grain is grown. Nearly all the Arabs are wanderers, and rear camels, horses, sheep and goats.

There is no central government in Arabia, owing to the difficulty of communication across the desert. Each tribe is under the control of its own chief or Sheikh.

(iii) Oman.

Oman, in the south-east of Arabia, has a better rainfall than most of the peninsula, and is therefore more fertile. It is ruled by a Sultan, who resides at Muscat, on the Gulf of Oman. Muscat exports pearls and dates.

Questions.

- 1 Name the chief divisions of Turkey in Asia.
- 2 Name the chief towns and ports of the south-western peninsula, and say something of importance about each.

3 Write a description of the life of the Arabs

4 Which towns in Arabia are associated with the life of the Prophet Muhammad?

5 On an outline map, mark the boundary between Turkey in Asia and independent Arabia, also show the courses of the Tigris and Euphrates, and the positions of the chief towns in Turkey in Asia and Arabia

7.—Countries of the Plateau of Iran.

The plateau of Iran is occupied by **Persia**, **Afghanistan** and **Baluchistan**, of which the last-named is a part of the Indian Empire. Revise the physical features and climate of this region. It is an elevated area, with a border of mountain chains, and its rivers, except a few streams in the north-east, do not reach the sea. It has an *extreme* and *dry climate*, and it is therefore a semi-desert area.

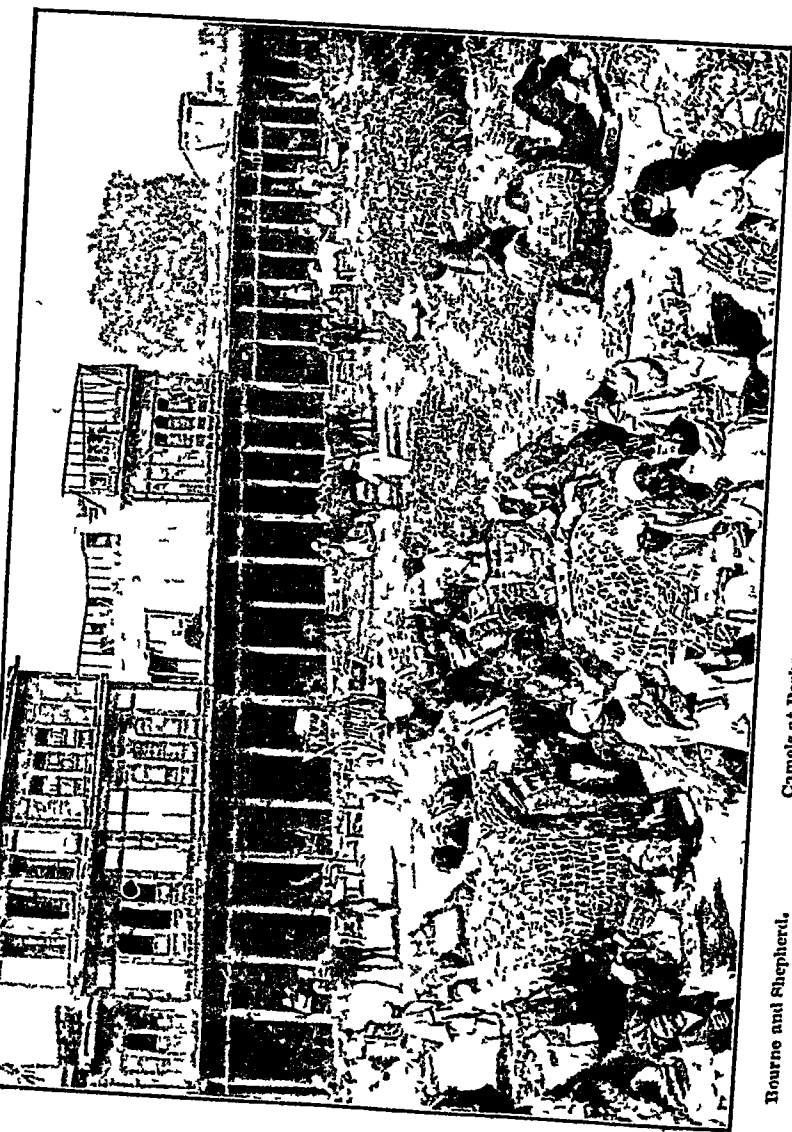
Persia, the western country, extends over two-thirds of the whole plateau. Look on the map and find out what countries border Persia on the west, north and east. Of the total area, one-third is a desert waste, chiefly in the east, and of the remainder, all but the region round the shores of the Caspian Sea suffers from lack of rain. Even the rivers are useless, except for a short season while the snows are melting on the mountains. Cultivation, therefore, can only be carried on by the help of irrigation, and this is very imperfectly done. Most of the people are pastoral, and, like those of

the neighbouring countries, rear camels, horses, sheep and goats. Wool is an important product, and Persian shawls and carpets are famous. Minerals, though abundant, are little worked, but salt from the Salt Desert, and mineral oil are being produced in increasing quantities.

The principal cities are in the west, where the region between the Persian Gulf and the Caspian Sea is more fertile than the dry country to the east. Find Teheran and Tabriz on the map. The former is the seat of government, and the latter, the nearest large city to Europe, is the chief centre of trade. Each has a population of over two lakhs. No other town in Persia has half that number of people. (Bushire and Bandar Abbas, the ports on the Persian Gulf, have considerable trade with Karachi and Bombay.)

Afghanistan.—Look at this country on the map. In shape, it is roughly four-sided, with Persia to the west, Baluchistan to the south, India to the east, and Russia to the north. It is the only country of Asia which has no coast-line.

Afghanistan has an extreme climate, and gets very little rain. In the northern valleys, where there are mountain streams, good crops of wheat and fruit are obtained. In the rest of the country, the people are pastoral, like those of Persia, and rear horses, camels and sheep.



Bourne and Shephard.

Cimols at Peshawar, preparing for the journey to Kabul

The country has no railways, but those of India and Russia approach within a few miles of the frontier on opposite sides, so a good deal of trade is carried through Afghanistan by caravans. A caravan leaves Peshawar by the Khyber Pass twice a week.

The capital is **Kabul**, on the river Kabul, which flows into the Indus.

Questions.

- 1 Account for the general backwardness of agriculture in Persia *the soil*.
- 2 Name the chief Persian towns (a) in the interior, and (b) on the coast. State an interesting fact about each.
- 3 Describe the life of the people of Afghanistan.
- 4 On an outline map, draw the chief mountain ranges, and insert the towns of the Plateau of Iran.

EUROPE.

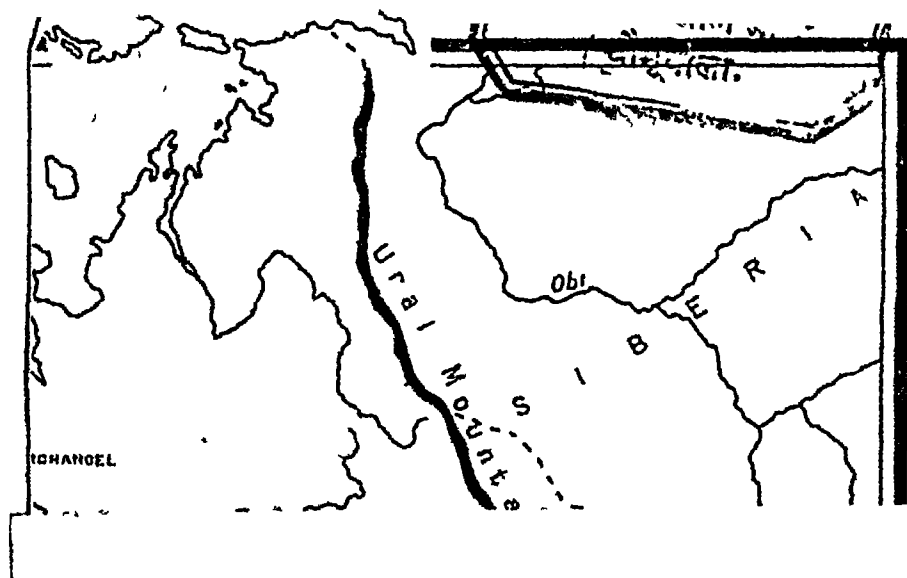
CHAPTER VII —SEAS AND COASTS OF EUROPE.

You have already learned that, geographically Europe is not a separate continent, but rather a large peninsula, jutting westwards from the mainland of Asia, the two together forming the land-mass, known as Eurasia

If, then, Asia and Europe are a single geographical unit, why do we study their geography separately? The chief reasons are—

- (a) Europe has grown for many centuries with a history of its own,
- (b) Its great centres of population are divided from those of Asia by large, thinly peopled regions; and
- (c) In industry and trade, the people of Europe are the most advanced in the world

If you think carefully about these three statements, you will see that, from the point of view of



geography, the last is the most important ; for the trade of a country and the occupations of its people are largely dependent upon its coasts and surface features, its heat and cold, and its rainfall Let us see then what special advantages are enjoyed by the people of Europe to account for their activity in industries and commerce.

(a) *Position*.—Look at a map of the land hemisphere. You will observe that Europe lies near its centre, a position of great advantage for trading with other continents)

(b) *Climate*.—Between what parallels of latitude does Europe lie? Only a very small portion of the continent lies outside the Temperate Zone The climate is therefore generally mild, and such that the people can work hard throughout the year, and make the most of their splendid natural resources.

(c) *Coast-line* —For its size, Europe has the longest coast-line of all the continents One of the chief benefits of a good coast-line is the help which it affords to sea-trade : Only in the east is the interior of Europe remote from the sea, and as the continent is well-supplied with canals and rivers, goods are easily carried to and from the many ports on the coasts

Coasts.—Europe is bounded by the sea on two of its three sides. On the south, the seas

are all enclosed, the greater part of the western coast is open to the Atlantic Ocean. You have already learned the names of the inland seas on the south, for they also wash the shores of Asia. The **Caspian Sea**, in the east, has no outlet to the ocean; so, although it receives the waters of the **Ural** river, and the great river **Volga**, it has not much trade. **Astrakhan**, the port, at the mouth of the latter river, is frozen for three months in winter.

The **Black Sea** has more trade than the Caspian, for it is connected with the **Mediterranean Sea** by the **Bosphorus**, the **Sea of Marmora**, and the **Dardanelles**. The northern shore of the Black Sea is divided into two parts by the **Sea of Azov**. The portion to the east has a background of mountains, and receives no rivers, the western portion is low and level, and receives the waters of several large streams, of which the most important are the **Dneiper** and the **Danube**. Find the two great ports of this region. **Odessa**, the port of Russia, on the Black Sea and **Constantinople**, the capital of the Turkish Empire, on the European side of the Bosphorus.

The **Mediterranean Sea** is the largest and most important inland sea in the world, it is the great highway of trade between Europe and the East.

Notice that the south coast of Europe, like the corresponding coast of Asia, has three peninsulas **Italy**, the central peninsula, and the island of **Sicily** at its foot, divide the sea into two basins. The British island of **Malta** lies a little to the east of the channel connecting the two basins, and therefore occupies a position of great importance, about half-way between **Gibraltar** and the **Suez Canal**.

The eastern basin of the Mediterranean Sea has two large openings, separated by the **Balkan Peninsula**. The **Ægean Sea**, to the east, has a very broken coast-line, and is dotted over with the beautiful and fertile islands of the **Grecian Archipelago**. It is bounded on the south by the long, narrow island of **Crete**. The shores of the **Adriatic Sea** are much more regular. Find the ports of **Trieste** and **Venice** on opposite sides of the head of the sea; they are situated where goods can be easily carried into the interior of the continent.

The western Mediterranean has no large openings, but it has several busy ports. Find **Naples**, the chief port of **Italy**, **Genoa**, whose position on the west corresponds with that of **Venice** on the east of the peninsula, **Marseilles**, the port of southern France, and **Barcelona**, the largest port on the east coast of Spain.) Notice also the large islands

in this basin **Sardinia** belongs to Italy, **Corsica** to France, and the **Balearic Islands** to Spain

The **Strait of Gibraltar**, at the western end of the Mediterranean Sea, is only nine miles wide. The rock-fortress of **Gibraltar**, to the north of the strait, is a British possession. Compare its position with that of **Aden**, at the south-west of Asia. These two British fortresses command the ends of the sea-route between the North Atlantic and the Indian Oceans.

The Atlantic coasts of Europe lie between the same latitudes as the east coast of Asia, north of **Korea**. What do you remember about the latter coast? A small portion to the south has a good climate, but even the port of **Vladivostok**, on the Japan Sea, is frozen for some weeks in winter, while the more northern part of the coast is so cold as to be quite useless for trade. The west coast of Europe, on the other hand, is one of the busiest in the world. The ports of Norway are open nearly all the year, and even **Archangel**, on the Arctic Ocean, is free from ice for six months in the summer. The cause of this remarkable difference is the **Gulf Stream**.

The Gulf Stream is a current of warm water which takes its name from the Gulf of Mexico, to the south of North America. After emerging from

this gulf, the current travels for some distance along the coast of the United States, and then drifts across the Atlantic Ocean towards the north-west of Europe, spreading a layer of warm water over the ocean as it flows. The winds which blow from the North Atlantic are thus warmed and moderate the climate of Western Europe.

(We may divide the Atlantic coast of Europe into three parts. Look at the southern portion between Gibraltar and the British Isles. The shores are fairly regular, with only one broad opening, the **Bay of Biscay**, which is renowned for its storms.

Now look at the northern portion. (The coast of Norway has numberless narrow inlets, and many tiny islands. Here the sea and the mountain torrents have been very active. They have worn away the soft rocks, and left the harder ones still standing, making the scenery along this coast very beautiful. The large opening in the Russian coast of the Arctic Ocean is called the **White Sea**.) Can you think of a reason for this name?

—More important than either the northern or the southern coasts, is the portion which lies between them. Here large openings wash the shores of the busiest countries of Europe and the trade is therefore very extensive. Find the **British Isles** on the map. The group consists of **Great Britain** on the east, with **Ireland** and many

smaller islands to the west. The seas surrounding the British Isles are very shallow : they are nowhere more than 600 feet deep. They are consequently one of the best fishing grounds in the world, and provide occupation for large numbers of people round their shores. The great British port, near the mainland of Europe, is **London** ; it is the busiest port and the largest city in the world. **Liverpool** and **Glasgow**, on the west of Great Britain, have also much trade, chiefly with America.

Separating the British Isles from the mainland are the **English Channel** and the **North Sea**. The **Strait of Dover**, connecting these two arms, is only 21 miles wide, and is crossed in an hour by the fast boats which are constantly plying between England and France. The large inland sea of Northern Europe is the **Baltic Sea**, connected with the North Sea by a series of straits. To save the journey through the straits, the **Kiel Canal** has been cut across the base of the peninsula of **Jutland**, which 'juts' northwards into the forked end of Scandinavia.

Notice that nearly all the great ports of these seas stand at the mouths of rivers. Find from the map the names of the rivers on which stand the ports of **Petrograd**, **Danzig**, **Hamburg**, **Rotterdam** and **Havre**.

Questions.

1. Give reasons why Europe has so much of the world's trade

2. Imagine yourself making a voyage from London to Bombay. Describe the route, as clearly as you can, and mention specially the British possessions you would pass

3. Why is the Atlantic coast of Europe so much more important than the Pacific coast of Asia between the same latitudes?

4. Account for the positions of Venice, Marseilles, London, the Kiel Canal

5. On an outline map of Europe, draw a line parallel to the coast, to show how much of the continent is more than 200 miles from the sea. On the same map, insert the names of the chief seas, straits and islands, and mark the positions of the chief ports

6. If a ship travels 15 miles an hour, how long will it take to travel from Port Said to Malta, and from Malta to Gibraltar?

CHAPTER VIII.—SURFACE FEATURES OF EUROPE

Examine a physical map of Europe, and find, on it the following physical features

1. **The northern mountains.**
2. **The great plain of the north.**
3. **The southern belt of Highlands.**
4. **The mountainous peninsulas jutting southwards.**

1 The **Northern Mountains** extend along the whole length of the Scandinavian peninsula, where they are called the **Scandinavian Mountains**, and appear again on the other side of the North Sea in the **Highlands of Scotland**. The Scandinavian Mountains are steep on the Atlantic side, and have a more gentle slope towards the Baltic Sea. Observe the effect of this on the rivers. No way has only short mountain torrents, which are not of sufficient length to be shown on the map Sweden has longer streams

2 The **Great Plain of Europe** occupies two-thirds of the continent. Notice its triangular shape. It is widest in Russia, where it stretches from the Arctic Ocean to the Caucasus mountains; it narrows down to less than a hundred miles in Belgium, widens out again in France, and

re-appears in the south-east of England, on the other side of the English Channel. You will remember that the great European War ^{which began in 1914} began in Belgium. This was because the most level, and, therefore, the easiest route by which Germany could invade France, passes through this country. The northern edge of the plain, bordering the Baltic and North Seas, is very low-lying. In Holland, much of the land is below sea-level, and the water of the ocean is kept back by means of bunds. Observe, too, that the lands round the Baltic Sea have many lakes.

If you examine on the map the courses of the rivers which flow across the great plain, you will see that there are two distinct slopes, a short slope to the north, and a longer one to the south. Trace the line of the watershed between them. It runs along the southern highlands, as far as the **Carpathian Mountains**, and thence across Russia to the centre of the Ural Mountains. Of the rivers which drain the northern slope, the most important are the Vistula, Elbe, Rhine, and Seine. The *Volga*, is the chief river flowing south. Trace the courses of these rivers on the map, and say with regard to each of them into what sea it flows.

The **Vistula** flows through fertile plains and thick forests, and has therefore much trade, but

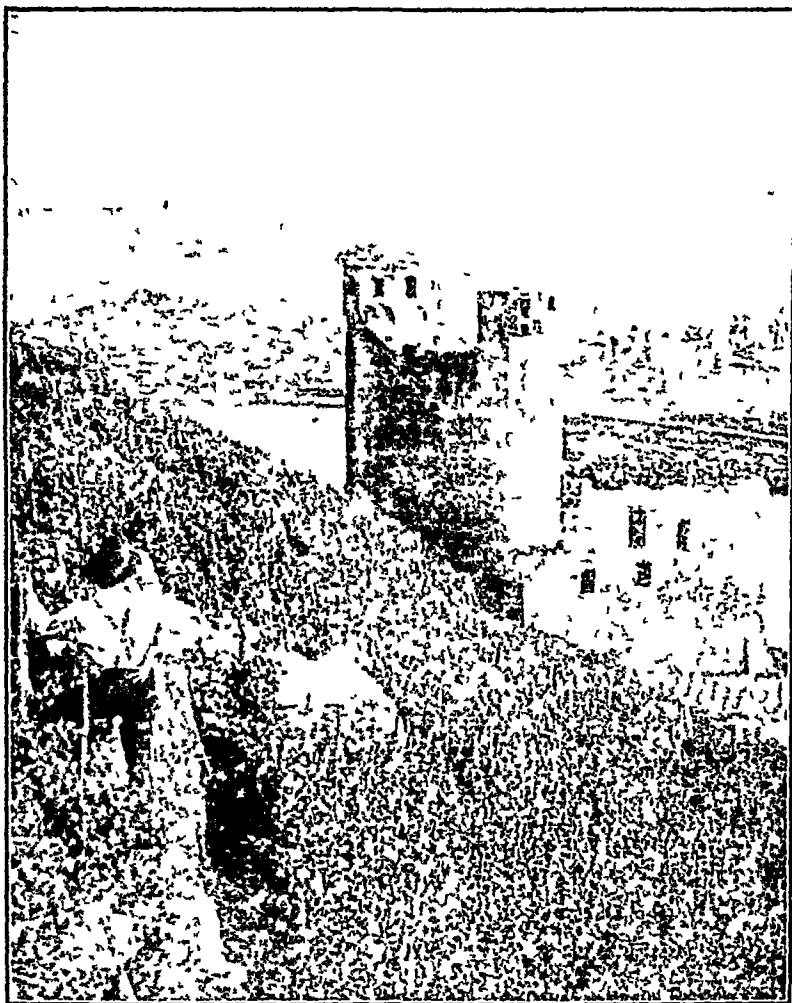
in winter, it is frozen over, and its mouth is ice-bound; so its port of Danzig is important for only a part of the year.

The **Elbe** and the **Rhine** flow through the great manufacturing districts of Germany, and have many important towns on their banks. Moreover, they are navigable for hundreds of miles, and fall into the North Sea, which is never frozen. so they are the most important rivers of Germany. The towns of Hamburg and Rotterdam, at their mouths, are great ports.

The **Seine** is the most important, although not the longest, river of France. It flows through the busiest part of the country. Find Paris on its banks; it is the capital of France, and the centre of its railway and canal systems. All the rivers of France are linked up by waterways.

The **Volga** is the longest river in Europe, and has the largest basin. As its bed is almost level, its current is very slow, and in winter it is frozen over, but in summer it is a busy highway, for in Russia people travel nearly as much in boats as they do in railway trains. Astrakhan stands on the delta.

3 The **Southern Highlands**.—Find Italy on the map. It corresponds in position to India in Asia, and, like India, it has the loftiest mountains of the continent along its northern boundary. These



Valley of the Rhine.

mountains are the Alps, which, like the Himalayas, consist of parallel ranges. These cover the little country of Switzerland, and spread south, west, north and east into the surrounding countries

The Alps are a much smaller range than the Himalayas, but their scenery is no less beautiful. They form a region of snow-capped peaks and green valleys, of mountain torrents and waterfalls, of beautiful lakes and glaciers. The lower slopes of the mountains are clothed with grassy meadows, with here and there a pretty Alpine village, higher up there are forests, where the ground is gay with bright-coloured flowers, and towering above the forests and meadows are the steep, silent peaks, which attract mountain climbers from all parts of Europe. One cannot wonder that, with so much natural beauty, the mountain country of Switzerland is regarded as one of the most charming spots in the world.

In a busy continent like Europe, it is necessary that trade should be carried on easily from one country to another, so there are several passes across the Alps. All these passes have good roads, but some of them are also crossed by railways, tunnels having been cut through the mountains. One of these tunnels is $12\frac{1}{2}$ miles long.

Just as in Asia, the great ranges spread outwards from a central knot, so in Europe all the southern highlands seem to start from the Alps.

The western end of the Alps curves round the **Plain of Lombardy** to join the **Apennine Range**, which forms the backbone of Italy, while highlands in the south of France connect the Alps with the lofty **Pyrenees Mountains**, the natural boundary between France and Spain

In the east, the Alps, like the Himalayas, turn to the south. Half-way down the Adriatic coast, they again turn east, under the name of the **Balkan Mountains**, which cross the Balkan peninsula. A spur from this range runs north to the Danube, and is extended beyond it in the great curve of the **Carpathian Mountains**, which enclose the **plain of Hungary**.

The chief rivers of the southern highlands are the **Danube** and the **Rhone**. Trace the course of the Danube on the map, and notice that, although its source is in Germany, and its mouth in Rumania, it really belongs to Austria-Hungary. With its large tributaries, it drains nearly the whole of that country. (The Danube is one of the most useful rivers in Europe), although only half as long as the Yangtse-kiang, (it is navigable for a greater distance. Find the great towns which have grown up on its banks—Vienna, the capital of Austria, Buda-Pest, the capital of Hungary, and Belgrade, the capital of Serbia. The lower course of the river is frozen over during January and February.)

(The **Rhone** is the largest European river to fall into the Mediterranean Sea) You will see from the map that it flows through a long valley, with mountains on both sides. Its current is therefore swift, and navigation is difficult.

The Mountains of the Southern Peninsulas.—Your map will show you that these mountains are connected with, and form a part of the southern highlands. We consider them separately, because each peninsula has a structure of its own. The Iberian Peninsula is a plateau, with mountain chains running east and west; *Italy* has a single range—the Apennines—running southward throughout its length; the Balkan Peninsula has a number of irregular mountain masses, which run in different directions.

Say, with regard to each of these peninsulas, how you think the rivers will flow, and then look at a map of Europe and see whether your conclusions are correct.

Questions.

1 Into what physical regions may the surface of Europe be divided?

2 Write a description of (a) the great plain, and (b) the southern highlands of Europe.

3 Name the chief rivers which drain the great plain (a) to the north, (b) to the south. Which of them have ports at their mouths?

4 Trace the course of the Danube Why is it a more useful river than the Volga?

5 On an outline map, insert and name (a) the chief mountain ranges of Europe, (b) the great rivers

6 A ship travels from London to Danzig *via* the Kiel Canal, and returns to London through the straits to the north of Denmark Find from the scale on the map of your atlas the difference in the length of the two voyages

CHAPTER IX —CLIMATE AND VEGETATION OF EUROPE

(a) **Climate.**—As Europe and Asia form one land-mass, the climate of the two continents in the neighbourhood of the boundary will be similar

Revise the climate regions near this line in Asia We found (a) a very cold region, with little rainfall, bordering the Arctic Ocean, (b) a region, with very cold winters and mild summers and better rainfall in the centre, and (c) the Mediterranean region, with a warm climate, and winter rains in the south)

These regions are continued into Europe. The Arctic region occupies only the north-eastern corner, but the Mediterranean region extends along the whole of the southern border of Europe

The climate of the rest of the continent, that is, of the great plain and the Northern and Southern Highlands, depends upon .

1. *Elevation* —Mountains lie to north and south and, on account of their latitude, the Scandinavian mountains are colder than the southern Highlands , but the mountains of Europe are not lofty compared with the great ranges of Asia, so only the highest peaks are covered with perpetual snow

2. *Nearness to the sea* —The seas lie to the west,

so the climate will become more extreme towards the border of Asia.

3. Wind direction.—The prevailing winds come from the south-west, over the warm waters of the mid-Atlantic. The western countries are warmed by these winds

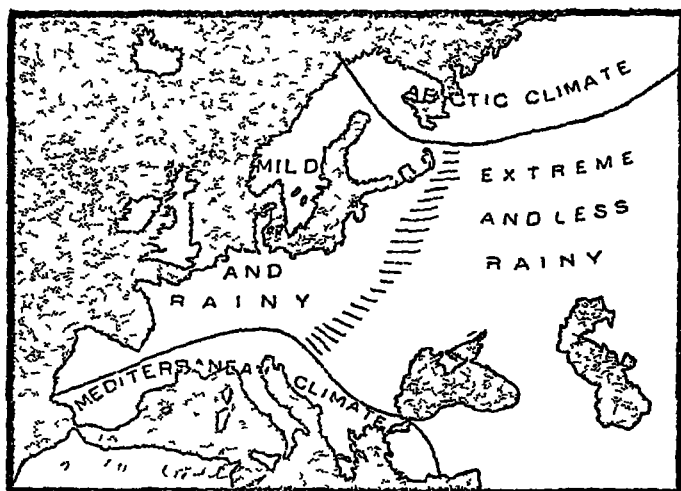
4 Rainfall.—These south-westerly winds bring plenty of moisture, so the western countries have a steady rainfall. As these winds travel eastwards, they become drier and give less rain. No part of the plain is, however, rainless, for two reasons. First, as they blow inland, they are constantly getting colder, and cold air, as you know, cannot hold so much vapour as warm air. Secondly, there is no mountain range to deprive them entirely of their moisture.

5 The Gulf-stream drift, as you have learnt, has the effect of making the climate of western Europe much warmer than any other region in the same latitude.

Thus Europe has four main climatic regions—

- (a) The *north-eastern*, with an Arctic climate.
- (b) The *eastern*, with an extreme climate and only moderate rainfall.
- (c) The *western*, mild and rainy.
- (d) The *southern*, with a Mediterranean climate

(b) Vegetation.—Compare the two maps on



Climate regions of Europe.



Vegetation regions of Europe

page 80, and observe how closely the vegetation regions follow those of climate

1 **The Tundra** is a region of very cold winters and little vegetation. No cultivated plants can be grown, trees cannot live, and, in the short summer, only moss and lichen cover the ground. This part of Europe is called Lapland, and its people are known as Lapps.

2 **The forest belt.**—Long ago forests extended in Europe, from the southern Highlands to Scandinavia. But most of this area is now cleared for agriculture, so the forest belt in Europe is narrow. Evergreens, such as the pine and the fir, are found in the north, and trees which lose their leaves in the winter, such as the oak and the beech, in the south of the belt.

3 **Cultivated plains and pastures.**
You read above that the climate of the great plain is mild and rainy in the west, and more extreme and less rainy in the east. This determines the kind of crop which is grown in different parts. Wheat and barley thrive in the west, and oats and rye in the east. Sugar-beet is extensively grown in the centre. Everywhere there are excellent pastures, but those in the west are better than those of Russia.

4. **Steppes.**—This is a region of treeless grass-lands. The people are mostly wanderers, who

move from pasture to pasture with their animals North of the Black Sea, where there is sufficient rainfall, the steppes are cultivated; here are the great Russian wheat lands, one of the world's chief centres of supply

5 **The Mediterranean Lands** grow wheat and maize and even cotton, but the warm dry summer is chiefly suited to the ripening of fruit. The grape is grown all over the region, and much wine is made. The olive provides oil, and the mulberry tree feeds the silkworm. Italy and France are the chief silk manufacturing countries of Europe

Questions.

1 Into how many climatic regions can Europe be divided? Describe the special features of each region

2 Give a general description of the climate of (a) France, (b) Italy

3 Describe the kind of vegetation you would meet with in a journey across Russia, from the Arctic Ocean to the Black Sea

4 Why is wheat a summer crop in Russia and a winter crop in the Punjab?

5 On an outline map of Europe, insert (a) the climate regions and (b) the vegetation regions

CHAPTER X.—THE COUNTRIES OF EUROPE

A.—Countries of the North and East.

Norway and Sweden.—The crest of the Scandinavian Mountains forms a natural boundary between the two countries of the northern peninsula. Norway, on the Atlantic side, is an elevated country of forested mountains. Sweden is less mountainous, with many rivers and lakes on the Baltic plain. The wealth of the people of Scandinavia consists chiefly in their forests, mines, and fisheries. The forests not only supply timber, but they also give rise to important paper and match-making industries. Paper is made from wood-pulp, and the soft straight-grained wood of the Scandinavian pine is suitable for making matches. The power for machinery in these manufactures is obtained from the swift mountain streams. The chief minerals are iron and copper. Swedish iron is of excellent quality, and is exported to England to be made into steel. It is not worked in the country so much as it would be if there were more coal. You have already seen that the seas surrounding Scandinavia are splendid fishing grounds.

Agriculture is carried on sufficiently to meet the needs of the people, and to leave a small surplus for export. The mountain slopes afford good

pasture for sheep and cattle, and on the plains of Sweden, oats, rye and barley are grown

Most of the towns of Scandinavia are to be found at the southern end of the peninsula, where the climate is temperate. **Stockholm**, the capital of Sweden, has a beautiful position on several islands on the Baltic side of the head of the peninsula. **Christiania**, the capital of Norway, stands in the angle formed by the two coasts at the southern end of Scandinavia. It has a fine harbour.

Denmark.—Closely related to the people of Scandinavia are those of Denmark, whose little low-land country occupies the northern half of the peninsula of Jutland and the neighbouring islands, thus commanding the entrance to the Baltic Sea. This position accounts for the importance of the capital, Copenhagen, a large port on a magnificent harbour.

Agriculture is the chief occupation of the people. Oats and barley are grown, but most of the land is devoted to pastures. Cattle, sheep and poultry are reared in large numbers, and there is a great export of eggs and butter.

The island of **Iceland** belongs to Denmark. Find it on the map. It has a small population engaged chiefly in fishing.

Russia, which occupies more than half the continent of Europe, is a great silent country of tundra, forest and steppe. It has much mineral wealth, but it is not yet fully worked, hence there is but little manufacture, and the people depend mainly on their forests and cultivated lands

The people of the *tundra* in the north are mostly wandering tribes, who are forced southwards in the winter by the cold. They live chiefly by hunting and fishing. In the forest belt, further south, there is trade in timber and in the furs of forest animals. Where the ground has been cleared of timber, rye, oats and flax are commonly^{^a} grown. You read on page 81 about the *steppes* in south Russia. North of the Black Sea are the great wheat lands, and here the population is more dense than in any other part of the country, further east there are pastures, while round the Caspian Sea steppe merges into desert

The internal trade of Russia is carried on chiefly by means of rivers, with which she is well-supplied. Railways join the chief towns, but many parts of the country are remote from a railway

Russia is very unfortunate in her ports **Vladivostok** on the Pacific Ocean, **Archangel** on the White Sea, and the Baltic ports are all frozen for some part of the winter. Her only other coast is on the Black Sea. Here **Odessa** also has a

cold winter climate, and, moreover, vessels from Odessa have to pass through straits held by other powers before they can reach the open ocean

(The capital of Russia is **Petrograd**.) The city was built on marshy ground by a former Emperor, Peter the Great, but it was not well-placed for a capital, for it stands on one side of the empire. **Moscow**, the second city, has a better situation near the centre. It was formerly the capital, and all the great railways meet there. **Warsaw**, on the Vistula, is the centre of trade in western Russia

Rumania lies to the southwest of Russia, and is a continuation of the Russian plain, between the Carpathian and Balkan Mountains. Find **Bucharest**, the capital, on the map. As in the neighbouring steppe lands of Russia, much wheat is grown, but the better climate makes the maize crop equally important, and timber is obtained from the western mountains

Questions.

- 1 Describe, as accurately as you can, the scenery you would expect to see in a journey through Norway
- 2 What are the chief occupations of the people of Scandinavia? Which of them are due to the presence of forests?
- 3 Account for the position and importance of the following towns: Christiania, Copenhagen, Archangel, Odessa, Moscow
- 4 On an outline map, insert the positions of the towns in the above mentioned countries in the north and east of Europe

B.—Countries of Central Europe.

Germany may be called the central kingdom of Europe. Look on the map, and see how many neighbours she has (Russia lies to the east, Austria and Switzerland to the south, France, Belgium and Holland to the west, and Denmark to the north. On the north, and south the boundaries of Germany are natural, but east and west they are artificial, and communication is easy

To what natural regions does Germany belong ? In the north is the plain, and in the south are the Alpine highlands. The rivers therefore rise in the south, and flow in almost parallel courses across the plain to the Baltic and North Seas, forming with their tributaries a fine network of waterways for river-boats. The harbours at their mouths, however, are not very good, for the water is too shallow to admit very large ships. Name from your map the chief rivers of Germany and the ports at their mouths

The northern plain is a good agricultural region, and splendid crops of wheat, barley, oats and rye are reaped. The climate is also well-suited to the growth of beet, and Germany exports more beet-sugar than any other country in the world. The southern highlands produce timber, and many cattle and sheep are reared on the mountain pastures

But it is as a manufacturing country that

Germany has made most progress. The rich mines in the south, and the coal and the iron found near together in the **Rhine**, **Oder** and **Elbe** valleys are well worked, and iron, cotton, woollen, and silk goods are produced and exported on a large scale. Her rapid growth in population as well as industry led Germany to look for means of expansion, and this was one of the reasons which led her to attack her neighbours in the great war.

Germany has no less than thirty cities, with a population greater than that of Allahabad. Of these you can learn only a few, find the following on the map. **Berlin**, the capital, has a good position in the centre of the country; railways spread outwards from Berlin in all directions. **Munich** and **Dresden** are situated on railway routes across the southern mountains. On the Rhine is **Essen**, with great ironworks where guns are made. **Hamburg** and **Danzig** are the great ports, the former on the North Sea, the latter on the Baltic. The Kiel Canal has been cut to afford a short passage between these two seas.

Austria-Hungary is the land of the Danube. Look at the map, and observe how this river and its tributaries drain nearly the whole country, the main stream dividing it into two nearly equal parts. The name, Austria-Hungary, tells you that there

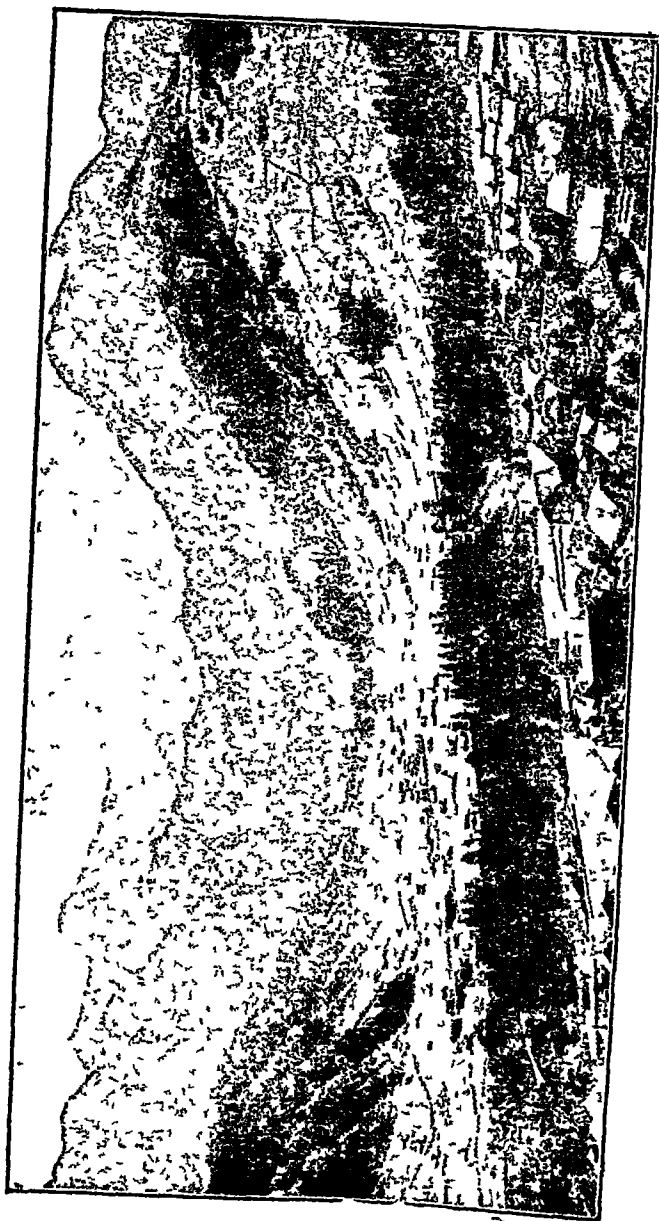
are really two countries, but as both are under one monarch they are politically one Hungary occupies the plain enclosed by the Carpathian Mountains and the Danube; Austria includes the mountainous provinces to the north and west. Notice the short strip of coast-line on the Adriatic Sea. This great country has only one large port, Trieste, and this does not stand at a river-mouth.

Many minerals are found, and there are some manufactures, of which glass is perhaps best known. But Austria-Hungary is chiefly an agricultural country. The plain of Hungary is one of the great wheat lands of Europe, and maize and beet are also grown in large quantities. Domestic animals are reared, especially horses, and much timber is cut from the forests on the mountains.

Vienna, the capital of Austria, stands on the Danube, and so does Buda-Pest, the capital of Hungary. Prague, in the north-west, stands in the centre of a large mining and manufacturing region.

Switzerland is a country of mountains and valleys of streams and lakes, of snow-capped peaks and glaciers.

The scenery of Switzerland is so beautiful that large numbers of people from all parts of Europe, and even from America, go there to spend their



Swiss Valley

holidays One result of this is that hotels are very numerous, and many people are engaged in occupations connected with the needs of travellers and visitors.

As the country is so mountainous, sufficient grain cannot be grown for the needs of the people, but the mountain pastures feed many cattle, and preserved milk and cheese are largely exported. The Swiss people are very clever workers, like the Japanese, but, owing to the lack of coal and iron, there are no great manufactures. Watches and clocks are made at Geneva. The capital is Bern, on a tributary of the Rhine.

Questions.

1 Germany and Austria are sometimes called the Central Powers of Europe. Why is this? Name the countries by which they are surrounded.

2 Describe the climate of Germany, and show how it is suited to the products which are grown there.

3 Follow on the map the course of the Danube, and name the important towns which stand on its banks.

4 Describe the scenery and occupations of the people of Switzerland.

5 Account for the importance of Danzig, Hamburg, and Trieste.

6 On an outline map, insert the chief mountain ranges, rivers, and towns of Germany, Austria-Hungary, and Switzerland. Mark also the boundaries of these three countries.



C.—Mediterranean Countries.

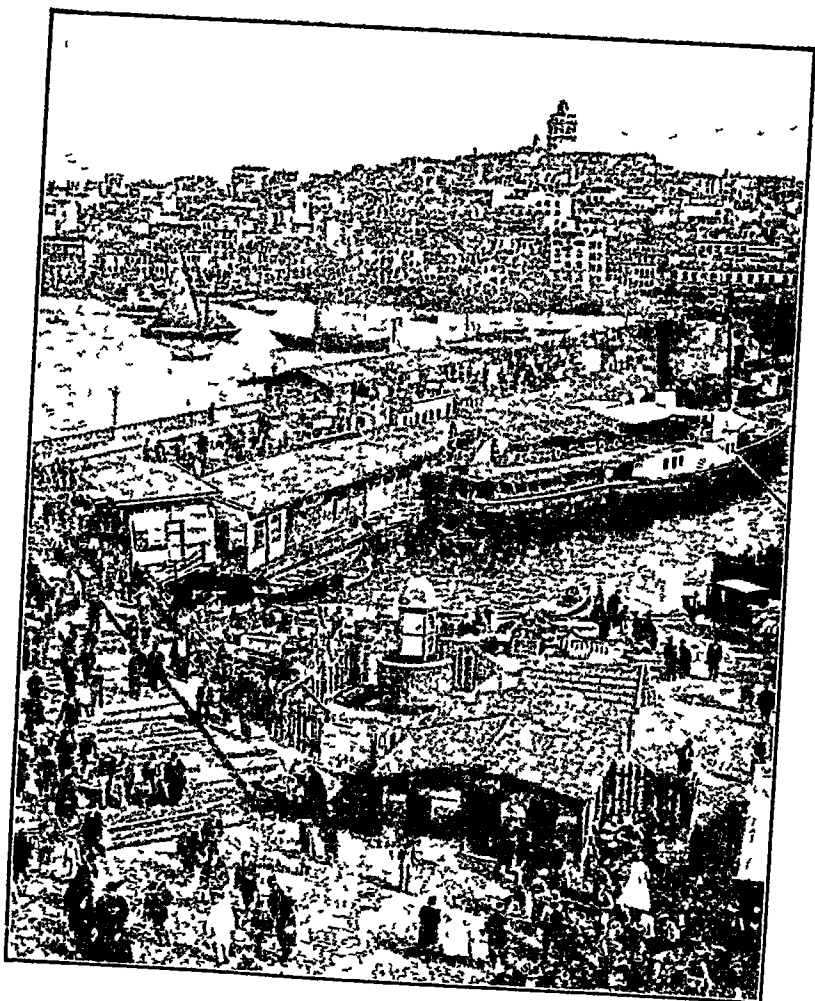
Countries of the Balkan Peninsula.—

Look at the map on page 92 You will see that the Balkan peninsula contains no less than six states—**Turkey, Bulgaria, Serbia, Montenegro, Albania, and Greece.** You should learn their names and the position of each Notice that Serbia, like Switzerland, has no coast-line.

How can we account for so many states in so small an area? There is little doubt that it is partly due to the irregular surface A country with so many mountains and valleys cannot easily be governed from a single centre; so gradually several states have grown up

The character of the surface will also tell you a great deal about the life and occupations of the people Fertile valleys in the interior are few in number the lower slopes of the mountains are covered with forests and pastures, while much of the peninsula is lofty, cold and bare. There are good minerals, but they are not much worked, and there are no great manufactures Hence the people are mostly agricultural, reaping small crops and keeping cattle Round the coasts, vegetation is abundant, and here the chief product is fruit.

The chief city is **Constantinople**, the capital of the Turkish Empire. It has grown up on the great highway between Asia and the south of



A View of Constantinople

Europe It has been an important town for 25 centuries Athens and Corinth are both ancient trading towns in Greece The most important towns of the interior are Belgrade, the capital of Serbia, and Sofia, the capital of Bulgaria Find all these towns on the map

Italy is a typical Mediterranean country, it has the best climate in Europe, and no part of the peninsula is far from the sea It is a land of sunshine, of warm breezes and clear air The charm of this country seems to have trained the Italians to love beautiful things, for they are very artistic, and adorn their homes and public buildings with fine statues and pictures, and they delight in music and song Nearly every Italian can sing, or play a musical instrument

You have already learned something about the physical features of the country The Alps enclose the Plain of Lombardy in the north, and the Apennines Mountains form a backbone to the peninsula This latter range is volcanic The famous volcanoes of Vesuvius, near Naples, and Etna in Sicily, are still active. The only large river is the Po, which drains the northern plain You may compare this river with the Ganges, its tributaries come from the mountains to north and south, and it has a delta at its mouth

Italy, like other countries in this region, produces fruits, and wine and olive-oil are made. The mulberry tree accounts for the largest silk manufacture on the continent. In the plain of Lombardy wheat and maize are grown.

Rome, the capital, is a very ancient city. Two thousand years ago, the Mediterranean region was the most important part of Europe, and as Italy lies in the centre of this area, the Roman Empire flourished for many centuries. Remains of its past greatness may still be seen. **Venice** was in ancient days an important port. It is built on islands, and has canals for streets. No carriages are seen in Venice, people go about in boats. **Naples** and **Genoa** are now the chief ports.

Spain and **Portugal** occupy the Iberian peninsula, a land of plateaux and mountain ranges. You have already seen that these ranges run east and west, separating river valleys.

The outer rim of the peninsula has a good climate and rainfall, but much of the interior is dry. Can you give a reason for this?

The pastures of the highland feed large numbers of sheep, and fruit trees are common, especially the vine, orange and mulberry. These vegetable products account for the manufacture of wine, silk, and woollen goods.

The peninsula also produces good minerals, of which the chief are copper, lead, and quick-silver; but they are sent to other countries to be smelted. Much copper-ore is exported to Great Britain.

Madrid, the capital of Spain, stands on a plateau. It is in the heart of the country, and this is its only advantage, for its climate is not good.

Barcelona, the Mediterranean port, is as large as Madrid, the population being equal to that of Madras.

Lisbon is the capital and the chief port of Portugal.

Questions.

1 Describe the surface of the Balkan peninsula, and name the countries of which it is composed.

2 Madrid, Naples, and Constantinople are on nearly the same latitude. Compare their climates.

3 In which of the three peninsulas of Southern Europe would you prefer to live, and why?

4 On an outline map, insert the boundaries and chief towns of Portugal, Spain, and Italy, mark also the following physical features, the Pyrenees, the Apennines, the Po.

5 Italy has 110,000 sq miles, and 36,000,000 inhabitants. Spain has 195,000 sq miles, and 20,000,000 inhabitants.

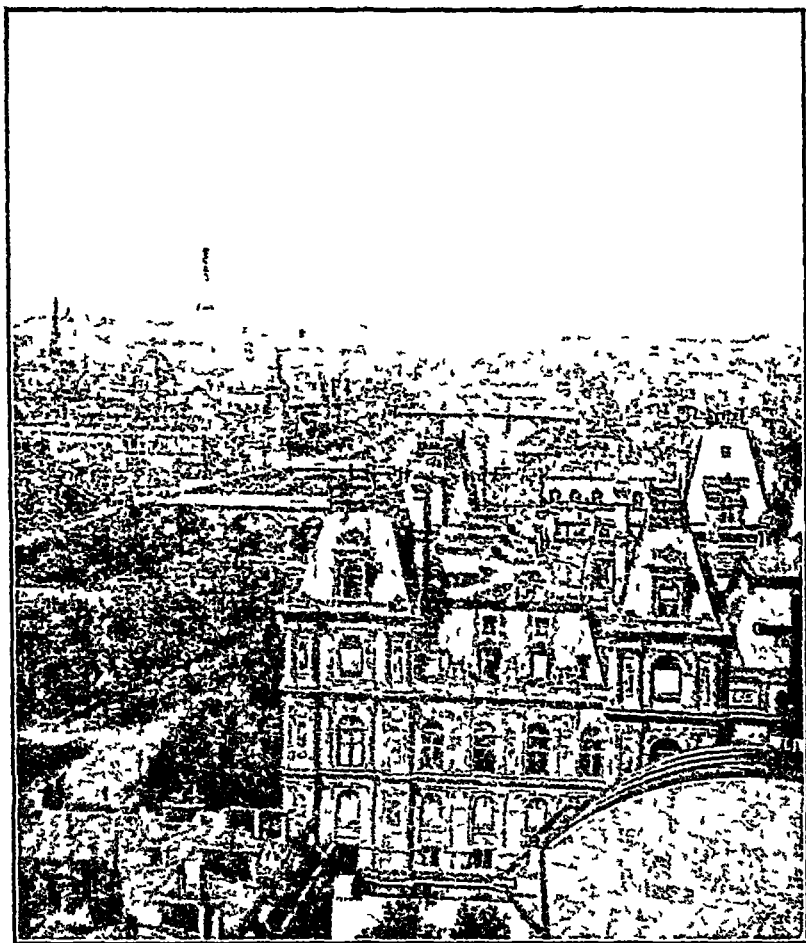
Find the average population per sq mile, and account, if you can, for the difference.

D.—Countries of the West.

France is an agricultural land of fertile plains and forested uplands. Point out these regions on the map. The plains occupy the north and west, and the spurs of the Alps the south-east. You will observe that France looks out on both the Atlantic Ocean and the Mediterranean Sea. It belongs, therefore, to two climatic regions. In the sunny south, grapes, olives and mulberry trees account for the manufacture of wine, olive-oil, and silk, **Lyons** on the Rhone being the greatest silk-producing town in the world. Further north, where there is more rain, large crops of wheat and sugar-beet are grown. More wheat is grown in France than in any other country of western Europe.

In the north-east, there are important coal-fields. They extend across Belgium, and link up with those of Germany. The same coal-belt re-appears in Great Britain on the other side of the North Sea. You should remember that this belt includes the great manufacturing region of Europe. The large town on the French part of the coal-field is Lille. Find it on the map. It manufactures linen and woollen goods.

The capital of France is **Paris**, on the river Seine. It is the largest and most beautiful city on the mainland of Europe. You have already learnt



View of the Seine at Paris

that it is the centre of the French railway and canal systems

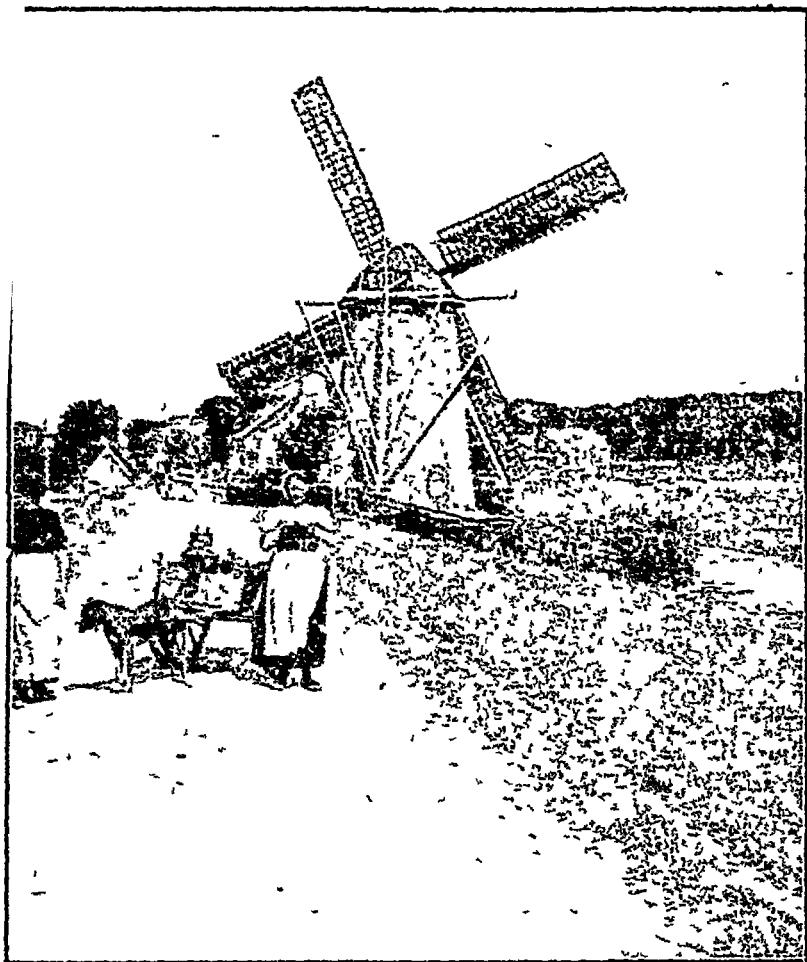
You have also learnt the names of the chief ports of France. Marseilles on the Mediterranean Sea, and Havre on the Atlantic Ocean - **Calais** is the nearest port to England. It is chiefly engaged in passenger traffic

Belgium is a busy little country, between France and Germany. It occupies the narrow end of the great plain, and, except in the south, is low and flat. In some places, the coasts are so low that dykes have been built to keep out the sea

Good crops of wheat, barley, sugar-beet and flax are produced on the plain, and sheep and cattle are reared on the hills of the south, but Belgium is chiefly a manufacturing country, owing to the presence of coal and iron. Iron, cotton, and woollen goods are exported.

Brussels, a fine city in the middle of the plain, is the capital. **Antwerp** is the chief port

Holland has an even lower surface than that of Belgium, and the sea and the river Rhine have often flooded large portions of the country. By patient labour, the Dutch have now dug canals to drain their land and built dykes to keep out the sea



Village scene in Holland.

Holland is entirely agricultural, the land being devoted chiefly to pasture. Butter, cheese and eggs are exported in vast quantities

The Hague is the seat of Government, but Amsterdam, the chief diamond market in Europe, and Rotterdam, the chief port, have each a much larger population

Questions.

1. What are the chief vegetable productions of France (a) in the north, (b) in the south? Account for the difference

2 Describe the surface of Holland, and the life of its people

3 How do you account for the fact that in Belgium there are more than 600 people to the sq mile, while in France there are less than 200?

4 State, as accurately as you can, the position of, and write a short note about, each of the following towns Lille, the Hague, Brussels, Calais, and Rotterdam

5 On an outline map, mark the positions of the chief towns of France, Belgium and Holland

E.—The British Isles.

We have now travelled round the countries of Europe and have arrived at the archipelago in the west—the British Islands—the centre of the great Empire to which we belong

Study this island group carefully on the map There are two large islands and several smaller

ones The largest island—**Great Britain**—lies to the east, and includes three countries, **England** in the south, with **Wales** on its western side, and **Scotland** in the north **Ireland** lies to the west of Great Britain. The four countries, England, Scotland, Wales, and Ireland, make up one kingdom, called the **United Kingdom**, under our King-Emperor, George V. The people of this kingdom are called the British people

The map will help you to realize why the British have become a great trading nation

(i) The British Isles are surrounded by the sea. The people are, therefore, good sailors and long ago began to make voyages to other lands. British sea-trade is greater than that of any other country in the world, so Great Britain has the largest and strongest navy, in order to protect this trade.

(ii) There are many fine harbours where commerce can be easily carried on.

(iii) The islands are situated in the cool temperate zone. This accounts for the good climate, which encourages habits of industry in its people.

(iv) The British Isles are nearer to America than other European countries. More trade goes on across the Atlantic than across any other ocean in the world.

Seas and Coasts.—The seas surrounding the British Isles are shallow; they are nowhere

more than 600 feet deep, and this is one reason why it is believed that the islands once formed a part of the mainland. Your map will show you that the Scandinavian Mountains are continued into Scotland, and the plain of northern Europe into England.

Find the names of the seas which wash the British shores. Some of these you have learned already. The **North Sea** and the **English Channel** (connected by the **Strait of Dover**) separate Great Britain from the continent, the **Irish Sea and St. George's Channel** divide Great Britain and Ireland.

You will observe that the west coasts, which are open to the Atlantic Ocean, are much more broken than those of the east. They resemble the coasts of Norway with its inlets and islands.

The larger openings into the coasts of Great Britain lie almost in pairs to east and west. The ~~most northern pair~~ ^{most northern pair of Firths of Forth and Clyde} are connected by a canal, but here there is not much trade, for the north of Scotland is very mountainous. The two openings in the south of Scotland—the mouths of the river **Clyde** on the ^{west} east, and the **Forth** on the ^{east} west—are much more important, for they drain a lowland area, with rich coal-mines and great factories. **Glasgow** on the Clyde and **Leith** on the Forth, are very busy ports. The former is the largest town in Scotland,

with iron, cotton, and ship-building industries, the latter is the port of **Edinburgh**, the capital of Scotland

England has also two pairs of large openings. Find the northern pair, with their ports **Liverpool**, at the mouth of the river **Mersey**, trades largely with America. A ship-canal connects **Liverpool** with **Manchester**: these are the great cotton ports of the country. They import the raw material, and export the manufactured fabrics. The northern opening on the east coast is the **Humber**. Its port, **Hull**, imports the product of the Baltic Sea.

The southern pair of openings are formed by the estuaries of the rivers **Severn** and **Thames**. **Cardiff** is the port on the former, and **London**, the largest city and port in the world, and the capital of the British Empire, on the latter.

The great-ports of Ireland have grown up on the side of the country nearest to Great Britain. **Dublin**, the capital of Ireland, is opposite **Liverpool**, and **Belfast**, a ship-building town, opposite **Glasgow**. Thus the trade of Ireland is chiefly with Great Britain.

Build.—Find **Hull** and **Bristol** on the map, and through these towns draw a straight line right across England from the east to the south coast.

You have by this line divided the island of Great Britain into two parts, which are very different from each other. To the north and west of the line there are highlands, to the south-east the country is more level. Thus Scotland and Wales and half of England may be described as generally mountainous. The **Highlands of Scotland**, in the north of that country, are not lofty, when compared with the mountains of India, but they are stern and rugged, and here the chief occupation of the people is cattle-rearing. The **Welsh Mountains**, too, are very irregular, but the valleys are wider and more fertile, and so agriculture is carried on, and there are more towns and villages. The highest mountains in England are in the north. Find the **Pennine Chain**, which forms a backbone to this part of the country, dividing the river basins to east and west. The **Lake District**, to the west of the Pennine chain, is one of the most beautiful parts of England, and a favourite holiday resort.

Ireland is very different in structure from Great Britain. Your map will show you that it consists of a plain in the centre, with groups of low mountains round the coast. Part of the central plain is marshy and unfit for cultivation. It is drained by the largest river in the country, the **Shannon**, which reaches the sea on the west coast.

Climate.—You can say, from what you have already learnt, what the climate of the British Isles is like. The Gulf Stream ^{Drift}, the warm south-westerly winds, and the nearness of all parts to the sea, make it mild and moist. As the prevailing winds blow from the west, bringing with them moisture from the Atlantic ocean, Ireland has a heavier rainfall than Great Britain, and the western side of Great Britain gets more rain than the eastern side. Snow falls in winter, and ice forms on the surface of ponds and lakes; but the British ports are never frozen, and it is not too cold for people to do their ordinary work.

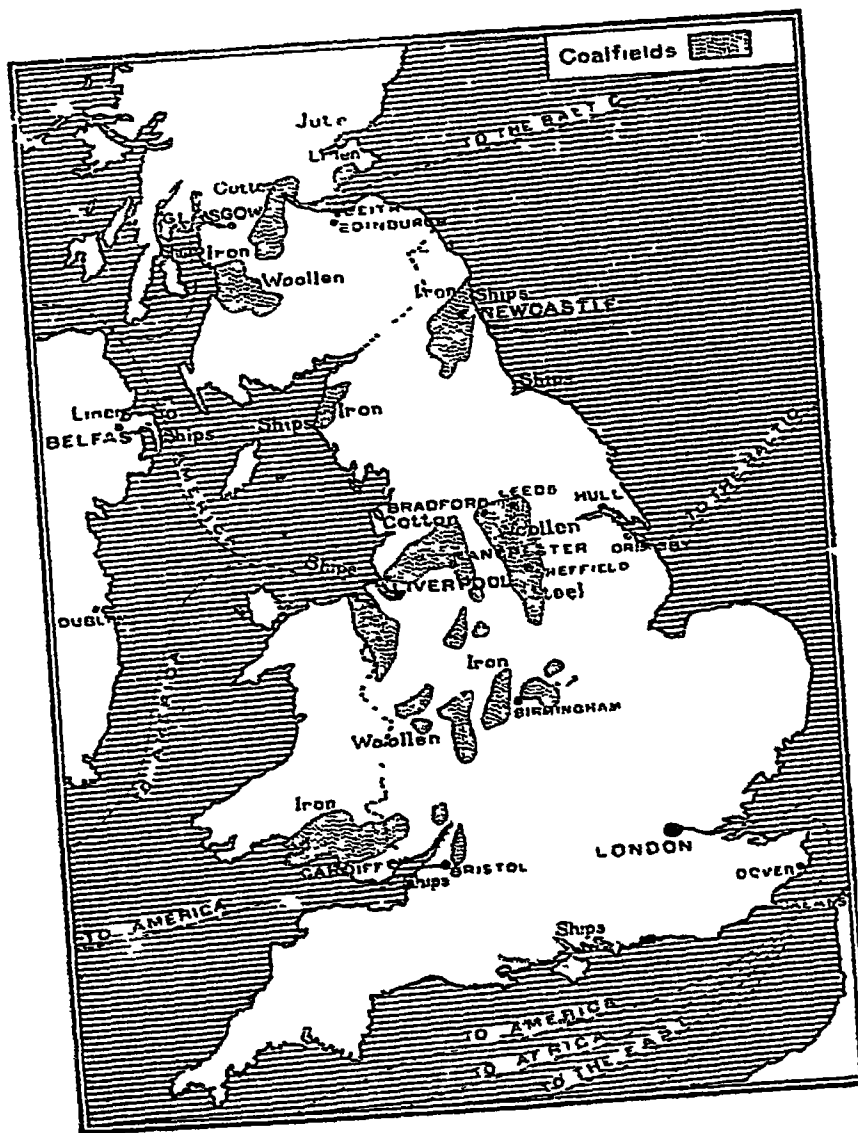
Occupations of the people.—1. Agriculture—This account of the climate, and what you read above about the surface of the British Isles, will help you to see in which parts of the country the people follow agricultural pursuits. In the more rainy districts and in the highlands, there are good pasture lands, where there is more sunshine, and on the lowlands, crops ripen well. Thus Ireland is almost entirely an agricultural country, producing wheat and other grains, potatoes and flax, and rearing cattle and sheep on its pastures. The highlands of great Britain, in the north and west, are chiefly pastoral, but on the plain of the south-east, and in the larger river valleys, wheat, barley, and oats are grown. The country cannot, however,

produce sufficient corn for the needs of its dense population, and much has to be imported

2 *Fishing* — As the seas round the British Isles are shallow, and the water is cool, they are one of the great fishing grounds of the world. The North Sea is the chief centre of the industry, and here thousands of fishing boats and trawlers are engaged. Grimsby, on the east coast of England, is the chief market for this trade.

3 *Mining* — The chief minerals raised in the British Isles are coal and iron. Look at the map on page 109, and notice carefully the positions of the coal-fields. They lie in the island of Great Britain, to the west and north of the line you drew, when you divided the highlands from the plain. Rich iron mines are worked near some of the coal-fields, but other minerals are not important. We may say that Great Britain owes her position as the leading manufacturing country of the world as much to her supplies of coal and iron as to the skill and industry of her people. Much coal is exported. Newcastle, in the north-east of England, and Cardiff, in South Wales, are engaged in this trade.

4 *Manufactures* — You read just now that Great Britain is the leading manufacturing country in the world. The number of different industries is so large that you can only learn about the most



Coal-fields, manufactures, and ports of the British Isles.

important of them These are carried on near the great coal-fields, where nearly all the large cities are to be found

(i) Iron goods.—The district near the coal-field in the middle of England is called the Black Country ^{in Warwickshire} If you were to travel through this district, you would see countless tall chimneys and iron furnaces giving out clouds of smoke This is the great iron-producing area **Birmingham** is the centre of the industry, in which several other large towns in the neighbourhood are also engaged Iron-smelting is also carried on at **Glasgow** in Scotland **Sheffield**, on the Yorkshire field, is renowned for its cutlery and steel goods

(ii) Cotton goods are made on the Lancashire coal-field You read above that Liverpool and Manchester are the great British cotton ports, and this largely accounts for its manufacture in this district, but another reason is to be found in the climate The moist atmosphere of the west prevents the fine cotton fibre from breaking, while it is being made into thread There are several large towns in Lancashire engaged in the cotton industry, but the largest of them all is Manchester.

(iii) Woollen goods are made on the Yorkshire coal-field, to the east of the Pennine Chain

The industry first sprang up here, on account of the sheep-rearing in the northern corner of the plain, but most of the wool now comes from Australia and South America to the ports of Liverpool and Hull. The chief towns engaged in the woollen trade are Leeds and Bradford.

(iv) Linen is made near the Forth coal-field in Scotland, for the flax is largely imported from the Baltic. Here also the *jute*, imported from Calcutta, is manufactured. Dundee is the centre. Flax is also grown in the north of Ireland, where it is woven by the help of coal imported from the neighbouring coal-fields in Scotland and England. Belfast makes some of the best linen in the world. You may remember, in passing, that the north of Ireland is called Ulster. It is the chief industrial part of the country.

(v). Ship-building is a very important industry in the British Islands; the ships built in British ports are the best in the world. The largest ship-yards are at Glasgow on the Clyde, Newcastle on the Tyne, London on the Thames, Liverpool on the Mersey, and at Belfast in Ireland.

(vi) Other manufactures of importance are machinery of all kinds, silk goods, earthenware, leather, paper, and several others.

You have learned the names of some of the largest towns in Great Britain and Ireland, in con-

nection with the industries You will realise that there are many more, of which you cannot learn the names, when you are told that there are more than a hundred towns, with a population of more than half-a-lakh. In India, there are about eighty such towns

We have still to mention **London**, the largest city of all—the first city in the world, and the capital of the Empire This great city does not owe its importance to the presence of coal, like many other large towns, it arose at the mouth of the river nearest to the mainland, with which trade has for many hundreds of years been carried on The present population of London is nearly five millions, and, with the suburbs, about seven and a half millions, or one-sixth of the total population of the United Kingdom London has many important industries, large dockyards, and great commercial houses It is the centre of the business of the world, and of the Government of the British Empire

Questions.

1 What natural advantages do the British Isles possess which have helped to make the people a great commercial nation?

2 Write a general description of the surface of Great Britain



A Street in London

Underwood and Underwood

3 What are the chief manufacturing industries of the people of the British Isles? Connect them, as far as you can, with the coal-fields

4 Why has Manchester become a great cotton manufacturing town, and Leeds a great woollen manufacturing town?

5 Account for the position of London, Hull, Glasgow, Liverpool and Dublin

6 On an outline map of the British Isles, (a) mark the highlands, and (b) insert in their proper places the names of the great manufacturing towns and ports

7 England has an area of 51,000 sq miles, and 31,000,000 people Scotland has an area of 30,000 sq miles, and 4,500,000 people Find for the two countries the average population per sq mile, and account for the difference

CHAPTER XI— NORTH AND SOUTH AMERICA

(i)—Surface and Rivers.

In 1492, an Italian, named Columbus, sailed westwards from Europe in search of a new route to India. After a voyage of ten weeks, he reached one of the groups of islands between North and South America. Thinking he was near the south-eastern coasts of Asia, he called the islands the **West Indies**, and the people he found there Indians. The descendants of these people are still called Red or American Indians.

Later, other sailors reached the mainland, and it was found that a new continent lay on the other side of the Atlantic. To this the name of **America** was given. The east coasts were soon explored, and from that time, or a little later, Europeans have settled in the new land, until now most of the people are of European origin. The total population of North and South America is to-day, however, only a little more than half that of India, and much of the surface has still to be developed. Thus the countries of America are 'new' countries, they have no long history behind them, like India or the countries of Europe. You should bear this fact in mind while studying their geography.

AMERICA

Build.—Look at the map on page 118 You will see that North and South America are connected by a long irregular isthmus This is called **Central America**. Observe also that both North and South America are triangular in shape, and that each has a group of islands lying off its northern shores

They differ, however, in outline, for whereas the coast-line of South America is regular, that of North America is broken by large openings Find the **Gulf of California** on the west, **Hudson Bay** on the north, and the **Gulf of St. Lawrence** and the **Gulf of Mexico** on the east The first is bounded seawards by a long narrow peninsula, the other three by islands

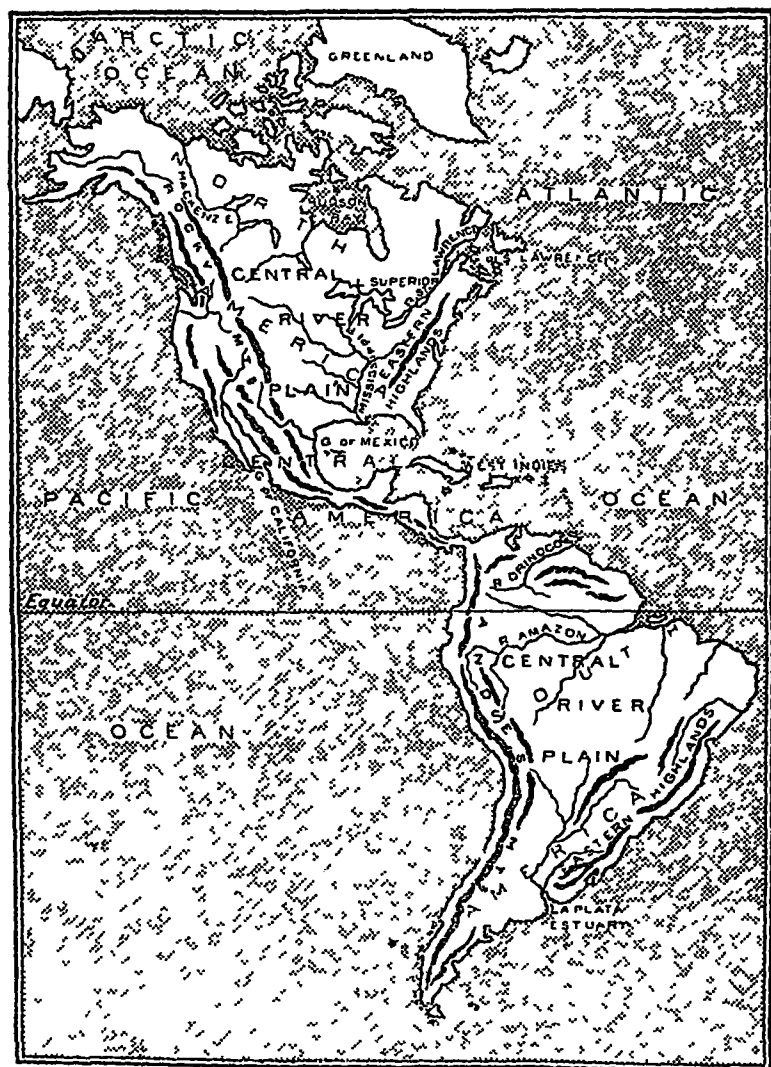
Surface.—The map will also show you that North and South America are very similar in structure Each has a continuous chain of highlands on the west, a second system of highlands to the east, and river plains in the centre.

The Western Highlands.—The great mountain chain in the west consists of parallel ranges The main range in North America is called the **Rocky Mountains**, in South America the **Andes**. These mountains form a part of the great world-line of volcanoes, which is continued on the other side of the Pacific Ocean in the island-chain, to the east of Asia

The Eastern Highlands.—Observe that in both North and South America the eastern highlands are divided into two parts by a great river valley—the valley of the St. Lawrence in North America, and the valley of the Amazon in South America.

Central River-plains.—These lowlands in both North and South America are drained by three large rivers, which may be studied in pairs. Find the first pair which flow towards the north coast—the Mackenzie in North America, and the Orinoco in South America. The Mackenzie is like the great rivers of Siberia. It drains a region of forest and tundra, it is frozen over in winter, its waters flow into the Arctic Ocean, and it is not therefore of much use for trade. The Orinoco, on the other hand, is a very useful river; it is navigable for 1,000 miles from its mouth.

The next pair of rivers—the St. Lawrence and the Amazon—flow to the east. Look at the map, and notice the five great lakes drained by the St. Lawrence. Lake Superior is the largest body of fresh water on the globe, and the five lakes drained by the St. Lawrence have together an area nearly equal to that of the United Provinces. Between the two smallest lakes are the famous Niagara Falls, where the river, half-a-mile wide, falls 170 feet. The estuary of the St. Lawrence is ice-bound for a few weeks in



Physical features of America

winter, but it is nevertheless a very important highway of trade. Ocean steamers can sail 1,000 miles up the stream for the greater part of the year, and there are another 1,000 miles of waterway on the great lakes. The Amazon is the second river in the world in length, but it has the largest basin, and the greatest volume of water. It drains an area larger than India. Each of its main tributaries is a great river, but they all flow through thick forests, and are little used. The main stream is navigable for over 2,000 miles.

The third pair of rivers flow to the south—the **Mississippi** in North America, and the rivers which flow into the **La Plata** estuary in South America. The Mississippi is the longest river in the world; it is over 4,000 miles long, or about three times the length of the Ganges. The main stream and its tributaries form a splendid network of waterways. Like the Ganges, the river brings down much silt, and forms a large delta at its mouth. The La Plata estuary receives the water of two large rivers. The volume of water which they bring down is nearly as great as that of the Amazon.

Questions.

1. What do you mean by a 'new' country? Why are large areas in North and South America still undeveloped?

- 2 Compare the structure of North and South America
- 3 Compare also their river systems
- 4 Say what you know about each of the following the Niagara Falls, the Amazon, the Andes, the St Lawrence, Lake Superior
- 5 On an outline map, insert the names of the chief sea-openings, highlands, and rivers of America

(ii)—Climate and Vegetation.

Whereas in shape, surface features, and river systems North and South America are very similar, in climate they are not at all alike. You can perhaps give the chief reason for this. The broad part of North America which contains much land at a distance from the sea, lies in the temperate and frigid zones, the corresponding part of South America lies in the torrid zone.

Climate and vegetation of North America.—Notice first that North America lies between nearly the same latitudes as Eurasia, both extend from the Polar circle to within a short distance of the Equator. We shall find that the climate of the coast regions of these two land-masses is very similar.

The eastern shores of Canada are like the Pacific coast of Siberia—cold and bleak, with little rain. Further south, the climate of the United States coasts resembles that of China, while Mexico and Central America have a hot climate, with heavy

summer rains like Indo-China. The west coast of Canada, like the corresponding coast of Europe, has mild, moist westerly winds. The United States coast further south, has a Mediterranean climate, and produces much fruit.

But, while the climates of the coast regions of Eurasia and North America are very much alike, that of the interior is very different. This is due chiefly to the arrangement of the highlands. In Eurasia, the mountains run east and west; in North America, they are north and south. Thus, in North America, there is no barrier to prevent the cold, dry winds from the north from blowing towards the south, while the prevailing winds from the west lose most of their moisture in crossing the Rocky Mountains. Only from the south can moist warm winds reach the interior. These blow in the summer, when the Sun is overhead north of the Equator, and they give a pleasant climate as far north as the centre of Canada. The cold, northerly winds blow in winter, and make the climate cold and dry as far south as the centre of the United States.

These facts about the climate of North America will help you to understand its vegetation.

I **The Tundra**, in the extreme north, includes Greenland and the rest of the northern islands and a strip of the mainland. It has a long cold winter, when the ground is covered with ice

and snow Only in the brief summer is there any sign of plant life Its people, the Esquimoes, lead a very hard life

2 **The Forest Belt** extends from the tundra towards the south of Canada, where the trees are being rapidly cleared for the cultivation of wheat The Rocky Mountains are also forested, especially on the western slopes, which get good rain from the westerly winds

3 **The Prairies** of the United States were formerly a vast pasture-ground, and many cattle and sheep are still reared Now large areas are cultivated, the main crops varying with the temperature—wheat in the north, maize in the centre, and cotton, sugar and tobacco in the south.

4 **Fruit growing regions** occur along the middle of the ~~east and west~~ coasts

5 **The Tropical region** of the south includes Mexico, Central America and the West Indies Here vegetation is abundant, except in the elevated interior of Mexico, which is rather dry The chief cultivated products are sugar, tobacco and tropical fruits

Climate and vegetation of South America—You will observe from the map that the whole of South America lies in the torrid and temperate zones Its climate is, therefore, nowhere cold, except on the heights of the Andes

Trace the line of the Equator, and notice that the basin of the Amazon lies in the belt of great heat and heavy rain. To north and south of this belt, heat and rainfall gradually decrease, the temperature being warm or mild according to the latitude, and the rainfall good, except in the extreme south of the continent which is dry.

The vegetation regions of South America correspond to the climate areas.

1 **Forests** --The equatorial belt of the Amazon valley is occupied by forests, which are the largest and densest in the world. Only along the coasts and river valleys have they ever been penetrated. The chief products of this region are beautiful varieties of timber and rubber. Along the east coast of Brazil there is cultivation, the chief exports being coffee, cotton and cocoa. Half the world's supply of coffee comes from Brazil.

2 **Llanos** --This is the name given to the plains north of the forest belt. The pasture lands of this region are being gradually cultivated, the crops being similar to those of the neighbouring countries and islands of North America.

3. **Pampas**.--These are the plains to the south of the forests. They are the most extensive pasture lands in the world, and many millions of horses, cattle and sheep are reared. Here also much

land is now cultivated, and enormous quantities of wheat and maize are exported

4 The plains to the south of the pampas are dry, bare and stony The only vegetation is scrub and poor pasture

Questions

1 Into what climate regions may North America be divided? Mention the chief products of each

2 Compare the climate of the coast regions of North America with that of the corresponding regions of Eurasia

3 Describe briefly the climate of South America Why is it so different from that of North America?

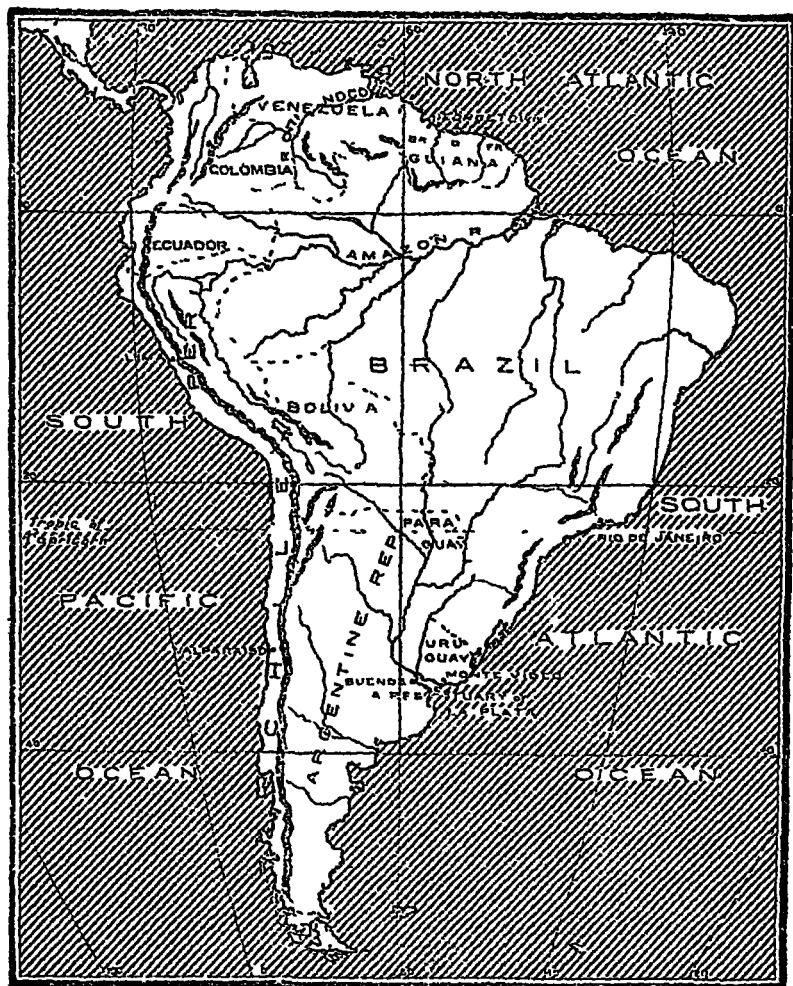
4 Into what vegetation regions would you divide South America? What are the chief products of the southern plains?

5 Mention the great wheat-producing areas in the world of which you have so far read Compare the climate of these areas

6 On an outline map of North America, insert in their proper places the names of the chief vegetable products

(iii)—People, Countries and Chief Towns.

South America — From what you have read you will see that most of the people of South America live round the coasts, so, although the whole continent has been divided into countries, much of the interior is very thinly peopled. American Indians are out-numbered by people of European origin, chiefly from Spain and Portugal



South America.

Cultivation is carried on in all the inhabited parts of the continent, especially in the coastal regions, and in the Argentine the rearing of horses, cattle and sheep is the chief occupation. The Andes are rich in minerals, and gold, silver, tin, copper, and quicksilver are mined. There is at present very little manufacture.

You will see from the map that most of the large towns are seaports, which have grown up where the people produce more than they require for their own needs.

Find on the map the two great ports on the La Plata estuary. Buenos Aires is the largest city in the southern hemisphere. It has a population greater than that of Calcutta, and Monte Video, the other port, is nearly as large as Madras. These places export the produce of the corn-fields and pasture-lands of the Argentine; wheat and maize, and meat, hides, wool, butter and cheese are sent to other countries in vast quantities.

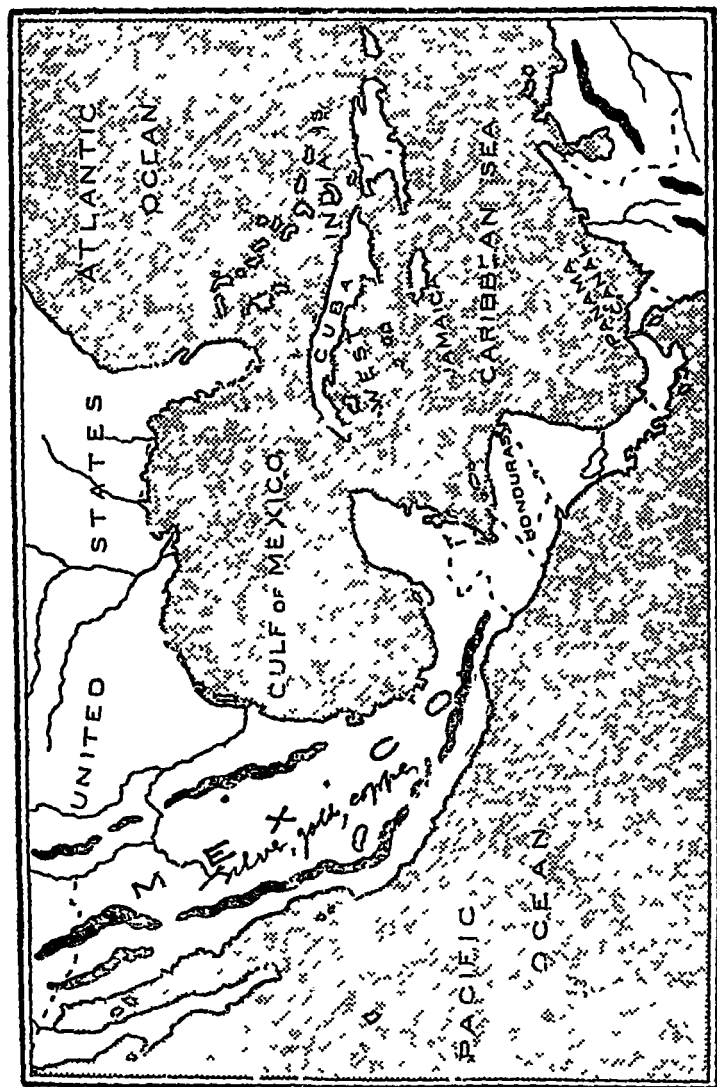
Further up the coast, on a splendid harbour, is Rio de Janeiro, a city as large as Calcutta, it is the chief port of Brazil, and exports coffee and rubber.

On the north coast is Georgetown, the capital of the small British colony of Guiana. Notice that the French and Dutch also possess pieces of Guiana. Georgetown exports sugar and cotton.

On the Pacific coast there are two large towns Lima, the chief town of Peru, is really five miles from the coast; it has its own port, and exports wool and rubber. Valparaiso is the chief port of Chile, and trades in wheat and wool. Chile also exports from its smaller ports the great mineral wealth of the Andes silver, copper, and tin. Owing to the lack of coal, the metals are not smelted, but are exported in the raw state. Peru and Chile furnish great quantities of a kind of soda which is exported to Europe to be used as manure for the fields.

West Indies.—You may compare this curve of islands to one of the loops in the chain to the east of Asia. They enclose the Caribbean Sea, with its large opening—the Gulf of Mexico. The islands are mountainous and volcanic like the mainland, and earthquakes are common. Volcanic soil is generally very fertile, and these islands are therefore very productive, they export sugar, tobacco and cigars, and fruit, such as oranges and bananas. The two largest islands have their own government. All the others belong to European countries. Jamaica is the largest island, belonging to Great Britain. *& Bama.*

Mexico and Central America.—Central America contains six small states and the little British colony of Honduras. All these states



and the larger country of México are very mountainous, and the vegetation varies with the elevation. On the coast lands there are tropical forests, and sugar, rice, and cotton are cultivated, higher up, the climate is suited to the growth of coffee and maize; while in the elevated and drier interior there are good pastures, and wheat is raised. Mexico is very rich in minerals More silver is produced than in any other country, and it also exports much gold and copper.

Recently a ship canal has been cut across the narrow part of the isthmus. You can see how useful the **Panama Canal** will be for trade, especially between the east and west coasts of America. The western ports of the continent will also be brought much nearer to Europe.

The United States occupy a wide belt across the centre of North America, with an area twice that of the Indian Empire. A century and a half ago, there were thirteen states along the Atlantic coast; now there are 48 states spread over the whole country, with a population of about ten crores. How are we to account for this remarkable progress? It is due to the great natural advantages of the country, combined with the industry of the people, who are settlers chiefly from north-western Europe.

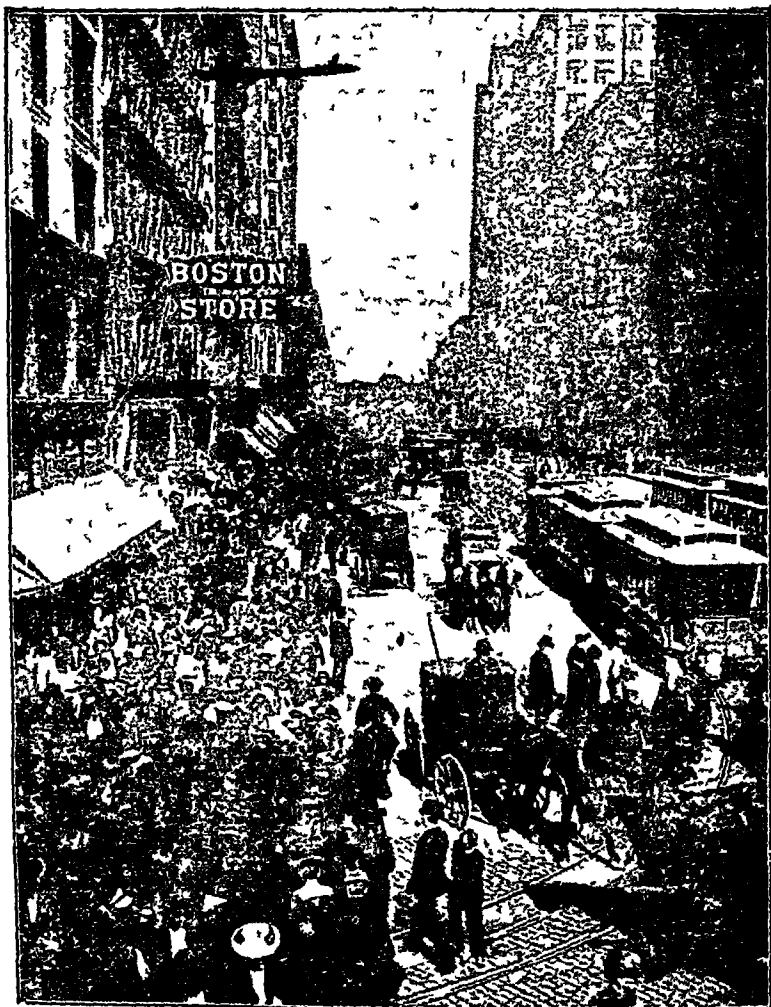
Think of the natural advantages of the United States. The climate is good, the soil is fertile,



North America.

much of the surface is a well-watered plain, only a portion of which was covered with forests, and, above all, minerals are abundant. You will understand how great is the natural wealth of the United States when you learn that the country stands first in the world in the production of coal, iron, copper, lead, timber, fish, wheat, maize, cotton and tobacco, and second in gold and silver.

The people make very good use of all these things, so they engage not only in agriculture, but also in mining, manufacture, fishing, and lumbering (cutting down timber). Iron, cotton, woollen and leather goods are made on as large a scale as in the manufacturing countries of Europe. The United States, therefore, has not only large seaports, but also many cities in the interior. There are no less than fifty cities, with a population of more than a lakh. Find the great ports on the east—New York, Boston, Philadelphia and New Orleans. New York is the second city in the world. It has a population of over 50 lakhs. New Orleans, on the Gulf of Mexico, exports cotton. The chief port on the west is San Francisco, which is connected by rail with New York. The second city in the United States is Chicago, near the great lakes. Pittsburg, about halfway between Chicago and New York, is the centre of the iron industry. Alaska, the country in the extreme north-west



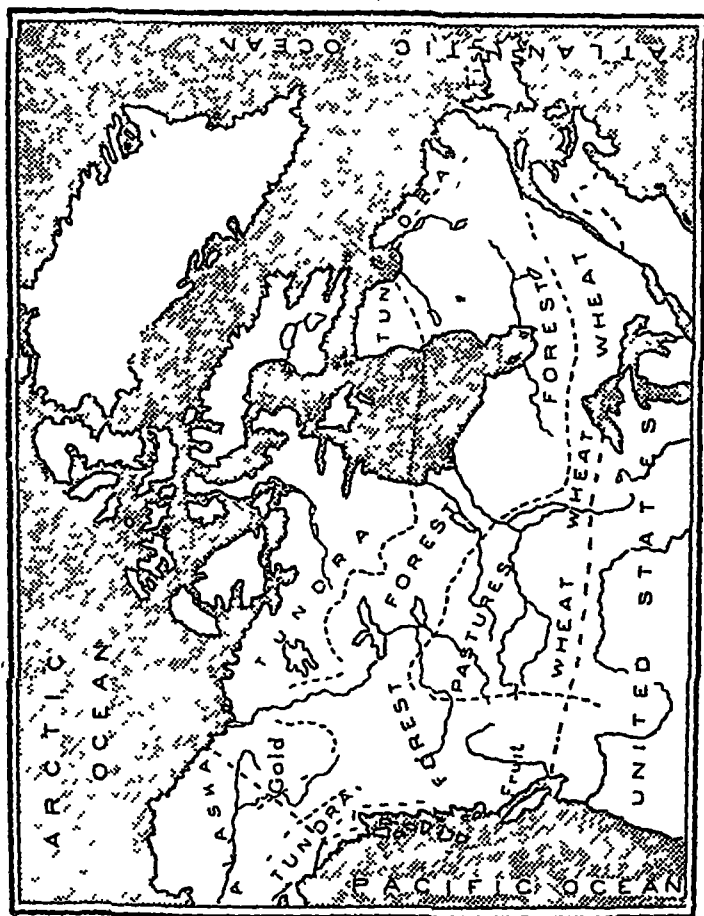
Street scene in Chicago

of the continent, belongs to the United States. Its most important exports are gold and fish.

Canada.

With the exception of *Alaska*, which belongs to the United States, the whole of the northern half of the continent of North America is a British possession (Newfoundland, the first colony of Great Britain, was obtained in 1583) and since that time the Empire has spread west and north, until British North America or Canada now occupies an area as large as Europe.

The whole country is divided into provinces, but, from what you have already learned, you will realize that only a part of it is settled. The *tundra* of the far north is cold and barren, here a scanty population lives by hunting and fishing. South of the tundra, there are vast forests, here, again, the population is small, and the people gain a livelihood either by hunting wild animals for the sake of their furs, or by felling timber and floating it down the rivers. Only along the southern strip have the British people settled in considerable numbers; and here progress in farming, mining and the timber industry has been so rapid that the *Canadian-Pacific Railway* now crosses the continent from ocean to ocean, and settlements are being made further and further north as the forests are being cleared. Let

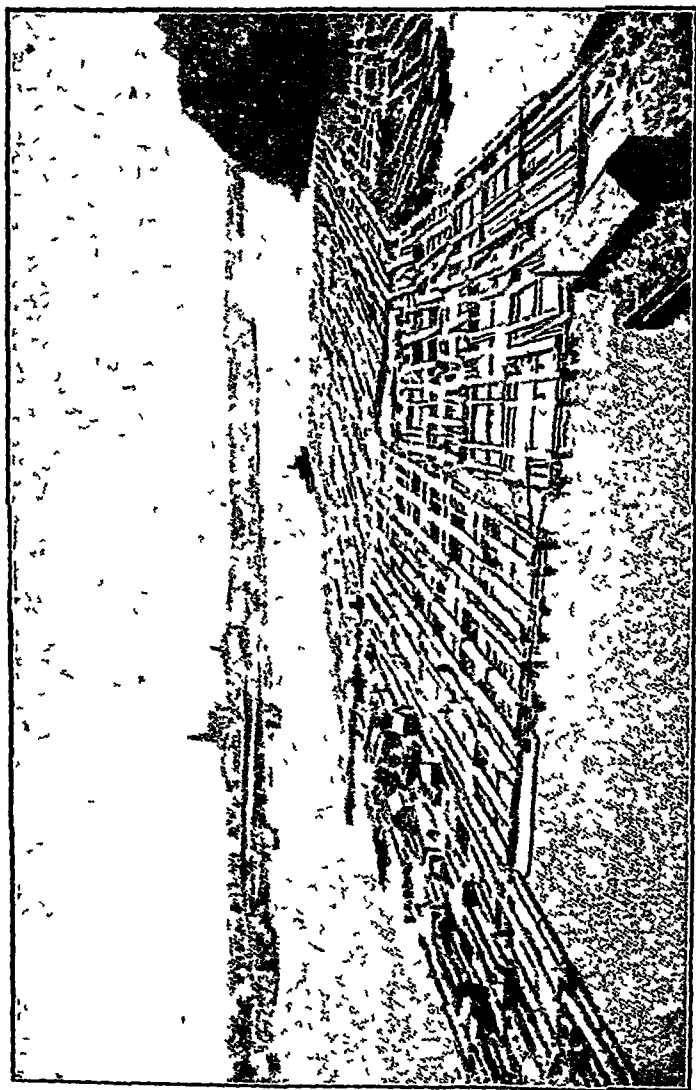


Vegetation regions of Canada

us trace the occupations of the people across this strip.

1 **The Gulf Provinces.**—The natural entrance into British North America from Europe is the Gulf of St. Lawrence, and this accounts for the importance of the river. Here you will find the large island of **Newfoundland**, some smaller islands, and the peninsula of **Nova Scotia**. The surrounding seas are shallow, and are one of the great fishing grounds of the world. Large numbers of fish are dried in the sun on the island of Newfoundland and exported from **St. John's**, the capital and chief port. The St. Lawrence is frozen over for some weeks in the winter, and ships cannot then sail up the river. During this season, **Halifax**, the capital of the little province of Nova Scotia, is the chief port of Canada.

2 **The River Provinces.**—Half the people of Canada live in the two provinces of Ontario and Quebec, which lie between Hudson Bay on the north and the great lakes and the river St. Lawrence on the south. This is the part of Canada nearest to Great Britain, and here the products of the interior are brought for export. Timber is floated down the rivers and sawn into planks or crushed into pulp to make paper, much wheat is grown, and in the south of the provinces there are extensive fruit orchards. Your map will show you



Transporting timber on a Canadian river

that most of the large towns are on or near the St. Lawrence. Montreal, the largest city in Canada, is also the greatest port Toronto, the second city, stands on Lake Ontario, and is also a centre of much traffic. Ottawa, the seat of Government, is a much smaller town on the river Ottawa, a tributary of the St. Lawrence. It has the largest saw-mills in the country.

3. **The Central Provinces.**—Three provinces, Manitoba, Saskatchewan, and Alberta, occupy the plain between Ontario and the Rocky Mountains. These are the great wheat-lands and pastures of the country, the former to the east, the latter to the west. In summer, fields of corn may be seen stretching for many miles, and every year, as the forests are cleared, more and more land is brought under the plough. Winnipeg, the third town in the whole country, is the centre of the wheat-trade.

4. **The Pacific Province.**—The western province of British Columbia has not yet a large population, but it has much natural wealth. The forests of the mountains give rise to the lumbering industry, valuable minerals are dug, and the mild climate of the coast is well suited to the growth of grain and fruit. All these industries are increasing. Vancouver, the port on the mainland, is the fourth town in Canada, in point of



Wheat field in Canada

population. Victoria is the port of Vancouver Island and the capital of British Columbia.

North of British Columbia is the province of Yukon. Here gold has been recently discovered, and Dawson City, the mining centre, grew up in a very few years.

Questions.

1 How do you account for the fact that the chief cities of South America are on the coast?

2 Where in America are the following products grown on a large scale timber, wheat, maize, cotton, tobacco, coffee, fruit?

3 Account for the position of Buenos Aires, Rio de Janeiro, New York, San Francisco, Montreal, Dawson City, the Panama Canal

4 Into what natural regions would you divide Canada? How far are they commercially important?

5 Describe the occupations of the people you would meet in a journey across Canada, from Newfoundland to Vancouver Island

6 On an outline map of America, write the words *lumbering*, *fishing*, *mining* and *agriculture* across the regions where these industries are carried on Write also in the agricultural regions the names of the crops raised.

CHAPTER XII.—AFRICA

(i) Surface and rivers.

For many centuries the only parts of the continent of Africa which were known to the people of other lands, were the northern countries bordering the Mediterranean and Red Seas. In very early times caravans from Asia reached the Nile, and even travelled along the north coast as far as Morocco, and the people of Europe also traded with these northern countries of Africa, but only the margin of the continent was known, for the Sahara Desert was an effective barrier to trade or exploration towards the centre and south. It was not until the great period of sea travel and adventure, about the end of the fifteenth century, that the east and west coasts began to be known. The **Cape of Good Hope** was first discovered in 1487, and Vasco de Gama, a Portuguese sailor, reached India by the 'Cape Route' ten years later. European trading stations were soon established on the African coasts, but the exploration of the interior was very slow. For many years Africa was spoken of as the 'dark continent,' and even now there are parts about which very little is known. The reasons for this slow progress were largely geographical, *e.g.*—

(a) The coasts have no deep openings

(b) The rivers are of little use for navigation

- (c) The shores are in many places very unhealthy
- (d) Large areas cannot be easily crossed—they are barren desert or dense forest.
- (e) The people were in many parts very unfriendly.

You will learn more about these statements in due course.

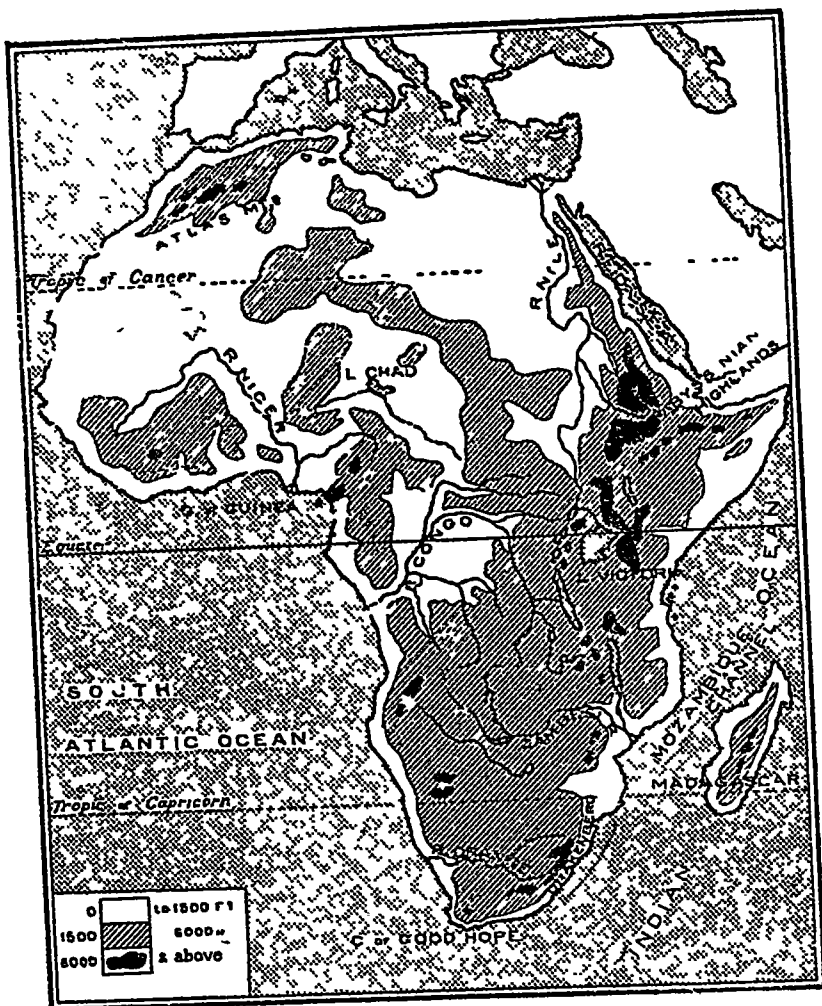
Build.—A glance at the map will show you that the coasts of Africa are even more regular than those of South America; there are no deep openings to help communication with the interior, or to influence the climate. The area of Africa is three times as large as that of Europe, but its coast-line is actually shorter. The coast makes a big bend on the west, called the **Gulf of Guinea**, and the **Red Sea** and the **Gulf of Aden** separate Africa from Asia on the east; but none of these break the regularity of the coast. The only large island is **Madagascar** in the south-east, which is divided from the mainland by the **Mozambique Channel**, 230 miles across the narrowest part.

Surface.—The map on page 143 will make the surface features quite clear to you. The area left white, chiefly in the north of the continent, is below 1,500 feet in elevation; the shaded portion is plateau, between 1,500 and 6,000 feet above sea-level; the mountains are printed black. You learn from this

map that the greater part of the surface of Africa consists of a plateau, higher in the south than the north, and in picturing to yourself the geographical conditions of Africa you must bear this fact clearly in mind, for, as you know, the elevation has a great effect upon the climate, and the elevated parts of the continent are not so hot as other and lower countries in the same latitudes

Only in a few regions of Africa are there well-defined mountain ranges. In the north-west, the **Atlas Mountains** are really a part of the southern highlands of Europe, for they are evidently a continuation of the Apennine Mountains of Italy. In the south-east, the **Drakenberg Mountains** form the rim of the plateau in Natal, and continue under other names along the whole of the southern border. The highest mountains on the continent are near the Equator. The **Mountains of Abyssinia** make that country very rugged and irregular, and provide the Nile with much of its water.

As regards its surface features, then, Africa differs remarkably from the continents you have already studied. Asia and Europe consist of highlands and plains, the highlands running east and west; North and South America also contain mountain ranges and plains, but the ranges in America extend from north to south, Africa (and,



Surface features of Africa

as we shall see later, Australia also) consists largely of plateaux, with very few mountain ranges.

Rivers.—Trace on the map of your atlas the courses of the four great rivers of Africa, the Nile, the Niger, the Congo, and the Zambesi, and find out in each case how much of the course is on the plateau. You will readily see that where the rivers flow down the sloping edges of the plateau to a lower level, they will form rapids or waterfalls, and traffic will be impossible. The fact that boats cannot sail far up the African rivers is, as you have already learned, one of the reasons why the interior of the continent remained so long unexplored.

The Nile is the third in length of all the rivers of the world, only the two great rivers of America being longer. It takes its rise in the streams which flow into *Lake Victoria*, on the Equator. It flows for a long distance on the plateau, and here its course would be navigable, but for the large masses of floating weeds which are, in many places, too thick to be pierced. Its chief tributaries are the Blue Nile and the Atbara. It is the water and silt which these streams bring from the mountains of Abyssinia which give Egypt its name—"the gift of the Nile."

The river descends from the plateau in six cataracts, which you will find marked in the map.

of your atlas, and for the last 1,500 miles it flows through the desert; it is navigable for 800 miles from its mouth, a longer distance than any other African river. In its course through the desert, the Nile annually overflows its banks after the Abyssinian rainy season; and this has made the country of Egypt—a green strip in the desert about fifteen miles wide. **Cairo**, the capital of Egypt, and a very ancient city, stands at the head of the large delta. **Alexandria** is the port on the Mediterranean Sea.

The **Niger** flows in a great curve through the fertile district between the Western Sahara and the Guinea coast. It has a steady current for many hundreds of miles, but there is a series of rapids where it breaks through the rim of the plateau not far from the coast. Near the sea it begins to deposit its silt, and an extensive delta has thus been built up.

The **Congo** is the river of Equatorial Africa. You should compare it with the Amazon in South America, it flows through a similar region of dense forests. In its middle course on the plateau, the Congo is a splendid waterway, and is navigable for nearly 2,000 miles, but it forms rapids in its lower course, and ships can ascend the river for only 100 miles from the sea.

The **Zambesi** is the chief river of South

Africa It is navigable for 1,000 miles in its upper course, but at the **Victoria Falls**, the river, over a mile wide, flows over cliffs 400 feet in height, and surges along in a gorge only a hundred yards broad. The Zambesi has a vast delta at its mouth.

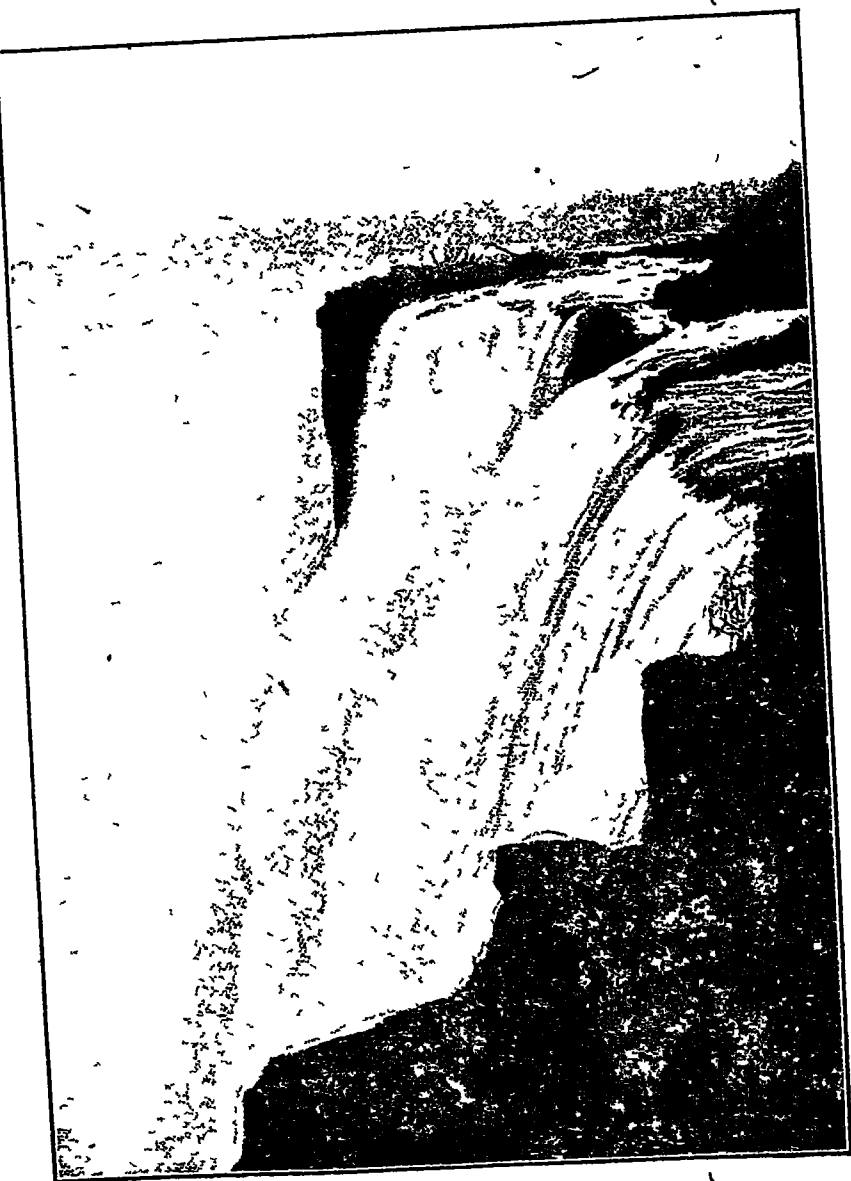
Rivers of Inland Drainage.—In an elevated continent, like Africa, there will be many streams which do not break through the raised edge of the plateau to reach the ocean. The largest basin of inland drainage is that of Lake Chad in the Sahara, which receives the waters of two streams.

Lakes—Find on the map the lake district of Africa. Several lakes seem to be arranged in lines. They occupy depressions or rifts in the Earth's surface, which are said to be a continuation of the Red Sea depression. Trace these depressions on the map, and find the names of the largest lakes. Lakes **Victoria, Albert and Edward** are drained by the Nile, **Tanganyika** by the Congo, **Nyassa** by the Zambesi, while Lake **Rudolf** has no outlet to the sea at all.

Questions.

1 Give reasons for the delay in the exploration of the interior of Africa.

2 Describe the surface of Africa, and say in what important respects it differs from the surface of Eurasia and America.



Victoria Falls.

3 In what way do the rivers of Africa resemble each other? Describe the course of the Nile

4 Compare the basins of the Congo and the Amazon

5 Where are the great lakes of Africa situated? By what rivers are they drained?

6 Egypt has been called the "gift of the Nile" Explain this

7 Shade an outline map of Africa to show elevation. On the same map trace the courses of the great rivers, and show the chief lakes!

in what parts of
 (ii) **Climate, vegetation, and people.**

Climate. — The climate of Africa is very easy to learn. It is the most regular of all the continents. Look at the map and observe that the Equator almost bisects the continent. The climates north and south of this line are very similar.

1 The **equatorial belt** ^{25° to 5°} is hot at all times, and has heavy rain all the year round. This region includes the basin of the Congo, and should be compared with the basin of the Amazon in South America.

2, North and south of this belt there are regions, still hot, of **summer rainfall**. These regions correspond to the belts between latitudes about 10° and 20° north and south. Remember that the Sun is overhead, and there is summer from May to August north of the Equator, and from November to February south of the Equator.



3. Beyond these two belts are the regions of **little or no rainfall**. In the north, this region is very large, and extends across the whole breadth of the continent, in the south, it is much smaller. Look at the climate-map on page 149, and see whether you can explain the existence of a desert in the south-west.

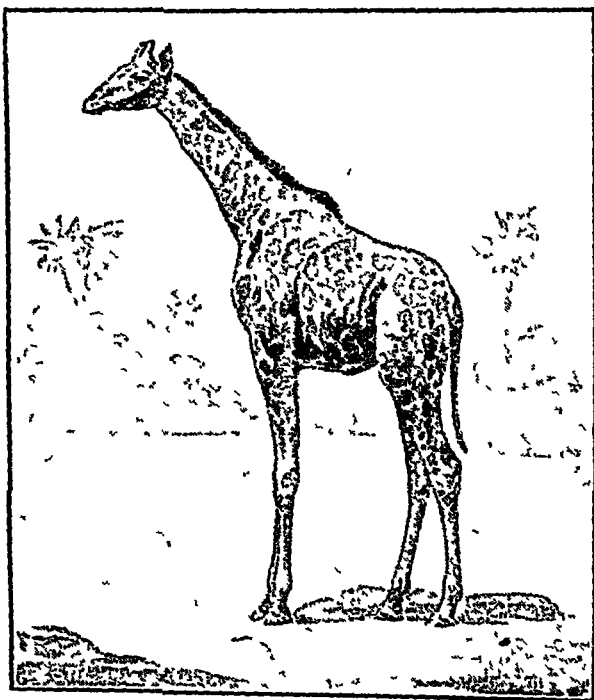
4. Beyond the dry belts, narrow strips in the extreme north and south lie in the region of westerly winds. These have a **Mediterranean climate**.

--- **Vegetation**.—Compare the two maps on page 149, and see how closely the vegetation regions follow the climate zones.

1 **Forests**.—In the equatorial belt, and on the rainy south-east coasts, there are dense forests, similar to those of South America. The heat and the moisture render the undergrowth in some places so thick as to be quite impassable, men and animals which move about on the ground cannot find space to live, and the only creatures which can live in these parts are such as make their homes in the branches of trees, such as monkeys, reptiles, birds, and insects. The chief forest products are rubber and palm-oil, and in clearings cocoa is being grown.

2 **Grasslands**.—North and south of the forest belt, trees begin to be less abundant, and

grasslands appear. Many sheep and cattle are reared, and where cultivation is being carried on, the most commonly grown crops are cotton and maize. Many wild animals, such as the lion, elephant, gnaffe, and deer roam over the grasslands, and ivory is an important article of trade.



The Giraſſe

3 Deserts.—The grasslands gradually merge in scrubland and desert. The former provides very poor pasture, but the desert, especially in the

north, is very like Arabia. Large areas are without a single inhabitant, and only where there is water do oases spring up, and there the people grow a few crops for their own use.

4 The Mediterranean lands consist of the Atlas coast strip and the Nile valley in the north, and the coast lands of the south and south-east. These have a pleasant climate, and produce good crops. In the north, fruits, wheat, barley and maize are grown, with cotton, sugar and rice in the Nile valley, in the south, the chief crops are maize, sugar and fruits.

People.—Africa is the home of the black or Negro race, Negroes are found in all parts of the continent south of the great desert. Just as the Sahara desert prevented the people of the north from travelling south, so it has hindered the Negro from spreading north. The Mediterranean shores of Africa and the lower Nile valley are inhabited by people of **Arab** origin, who are Muhammadans. They live in towns and villages cultivating their fields, or they wander over the desert with their camels, sheep and goats.

The Negro has a black skin, a broad flat nose, thick-lips and curly hair. He is strong and well-built, but he is generally lazy and unprogressive. He is found in the productive parts of the

continent where he can obtain the necessities of life without hard work, and he has done nothing to develop the great wealth of his country.



Negro.

But the more advanced peoples of the world cannot allow so much wealth to be wasted, and you can easily understand how it is that practically the whole continent is under the control of European Powers Great Britain, France, Belgium, Portugal, Italy and Spain, all have possessions in Africa.

Questions.

1 Describe the climatic regions you would pass through in a journey through Africa, from the Mediterranean Sea to the Cape

2 Show the close relation between the climate regions of Africa and the belts of vegetation.

3 Explain why there is a desert in the south-west of Africa

4 What different races of people are found in Africa ?
In what parts of the continent do they live ?

5 On an outline map of Africa, mark the climate regions

6 On another outline map, mark the vegetation region naming in each locality the chief crops

(iii). The Countries of Africa.

The Atlas Countries.—Find Morocco Algeria and Tunis on the map. They clearly form one natural region—the region of the Atlas highlands.

The countries of the Atlas region are under French rule. Algeria and Tunis are making good progress, but Morocco, which only came under French protection in 1911, is still very backward. Find on the map the capitals of the three countries Fez, Algiers and Tunis. The two latter are thriving ports. Tunis is the largest town, with a population of two-and-a-half lakhs. Observe its position opposite Sicily, controlling the channel between the two basins of the Mediterranean Sea.

The Sahara and Tripoli—If you draw a line across Africa, a little to the north of Lake Chad, you mark what may be said to be the southern boundary of the great desert. The only productive areas, north of this line, are the Atlas region, the Nile valley, and a very small coast strip in Tripoli.

In the Sahara are found typical desert conditions—sandy wastes, with little or no vegetation, a dry climate, with extremes of temperature. Only where wells can be dug are crops grown, and in these oases date-palms flourish and villages spring up. These villages make traffic across the desert possible, for caravans travel from oasis to oasis in their long and difficult journeys. The chief caravan routes converge on the Mediterranean ports, where the produce of Central Africa is exchanged for the manufactured goods of Europe. The camel is the chief means of transport in the north of Africa.

The Nile Valley.—You read above that Egypt is sometimes called the "gift of the Nile," that the country is a mere strip, a few miles wide. The dependence of Egypt on the Nile for her water supply is plainly seen from the rainfall. Cairo has only about an inch of rain in a year, Algiers has about thirty inches.

Abyssinia, like India, gets monsoon rains during the northern summer, and it is just after these heavy rains that the Nile rises and overflows its

banks, the period of flood being from about June to September.) The crops which benefit by the floods are wheat and maize; and these are therefore winter crops. But the main Egyptian crop is cotton, and this and sugar are grown in the summer, so they have to be produced on land which can be irrigated before the floods. In order to distribute the water when and where it is most needed, enormous dams have been built across the river.

As Egypt is an agricultural country, the people live mostly in villages and small towns. **Cairo** and **Alexandria** are the only two really large towns. The former is the largest city in Africa; it stands in a good position at the head of the delta, and has a population of about seven lakhs. **Alexandria**, the port of Egypt, has about half that population.

Port Said and Suez owe their importance to their positions at the ends of the Suez Canal. Port Said is one of the largest coaling ports in the world.

The **Sudan** and the **Guinea Coast** — Examine these two regions on the map in your atlas, and see exactly which parts belong to France and which to Great Britain. The Sudan stretches across Africa in a belt, south of the Sahara, in the east it is watered by the middle Nile, in the west by the upper Niger and the *Senegal*. It is a region of summer rainfall, which increases in amount from

the tropic to the Equator ; it is therefore a land of gradual change, from the scrub of the desert to the forests of the Congo basin. The trees of the northern Sudan produce gums ; further south, there are good pasture-lands, which are also suitable for agriculture, on the margins of the forests, the chief products are rubber and ivory. The greatest development has taken place in the fertile Guinea coast-lands. Here the Negroes are more civilized than in any other part of Africa, and agriculture and trade are rapidly increasing. The most important commodities are rubber, palm-oil, cocoa, cotton and gold.

Find from your map the chief towns in these regions. **Khartum** is the chief town in British Sudan. In the west, **Freetown** and **Lagos** are important settlements on the Guinea coast.

Abyssinia is in the same latitude as the Sudan, but, on account of its mountainous character, its climate and the life of its people are very different. They live chiefly on the hills and not in the valleys, they grow small crops and rear cattle and sheep.

East of Abyssinia, the 'horn of Africa' is occupied by **Somaliland**, partly Italian, and partly British. It is mainly desert, and has a small trade with Aden across the gulf, in desert products, such as *ostrich feathers and gums*.

Equatorial Africa may be divided into two parts • (1) the Congo forest lands to the west, and (2) the lake plateau to the east

Look at the basin of the Congo on the map ; it occupies nearly a million square miles, and is a Belgian possession In many ways, it is similar to the valley of the Amazon, the climate is hot and moist, the forests are in places almost impassable, and the people are backward and uncivilized, The chief products are rubber, palm-nuts and ivory, and these are found also in the coast lands to the north and south of the mouth of the Congo which belong respectively to France and Portugal .

The eastern side of Africa is much loftier than the western, so, although situated on the Equator, the interior of **British East Africa** has not an unpleasant climate The lower coast lands and the valleys of the highlands are forested, but the plateau is grassy, and many cattle and sheep are reared Agriculture is, however, improving rapidly, the chief crop being *cotton*

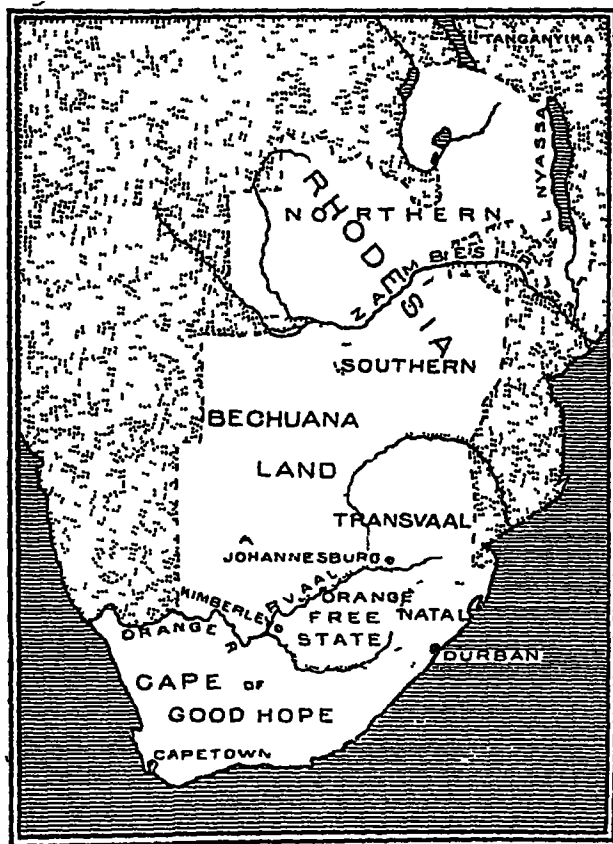
The chief port of British East Africa is **Mombasa** A railway runs to Lake Victoria Find the island of **Zanzibar**. It is a British possession Zanzibar and the little island of Pemba produce a large part of the world's supply of *cloves*. Other islands should be noticed **Madagascar** is a French possession, with exports of tropical

produce, such as rubber and sugar. Mauritius is a British possession, with a large export of sugar, grown by Indian coolie labour

British South Africa.—The climate of South Africa is the best on the continent. It is cooled on the coast by the sea, and in the interior by the altitude. Most of South Africa has an elevation only a little lower than an Indian hill-station, so its climate is suited to Europeans, who began to settle on the coasts over 200 years ago. The increase in the number of colonists and the discovery of gold, led to the people spreading inland, and now the colony stretches north, as far as Lake Tanganyika, a distance of nearly 2,000 miles. A railway has been built nearly as far as the river Zambesi, and when this has been connected with the Nile valley railway, it will be possible to travel by rail from the Cape to the Mediterranean Sea.

Look at the map, and the names of the six chief divisions of British South Africa. On the coast are **The Cape of Good Hope Province** and **Natal**; further north, are the **Orange Free State Province** and the **Transvaal**; in the interior are **Rhodesia** and **Bechuanaland**. The interior of the country has similar climate and products to the Argentine in South America. The people are nearly all farmers; they grow large quantities of maize, the chief food of the native population,

AFRICA



British South Africa

and millions of sheep feed on the plateau South Africa is a great market for wool

In various parts of the colony valuable minerals have been found, and mining is an important industry. The Transvaal produces more gold than any other country in the world. **Johannesburg**, the largest city in South Africa, is the centre of the richest gold-producing area. Nearly all the world's diamonds, too, are obtained in South Africa. **Kimberley** has the most famous mines

Another important industry of British South Africa is the rearing of the ostrich, for the sake of its beautiful feathers. The ostrich roams in great enclosures on the drier parts of the plateau, and feeds on the leaves of the wild bushes which grow there

On the coast strips, cultivation is extensively carried on. In the **Cape of Good Hope Province** wheat and fruits are grown, and much wine is made. The chief products of Natal are sugar and maize. So the leading occupations of the people of South Africa are farming and mining

The capital of the Cape of Good Hope Province is **Cape Town**, a port, with a population about equal to that of Karachi. **Durban**, the port of Natal, is much smaller



Questions.

reaching me

1 Describe the surface features and natural products of the countries of the Atlas region

✓ 2 Give a brief description of either (a) the Sudan or (b) the basin of the Congo

1/23 3 Describe the occupations of the people, and mention the most important products of British South Africa

4 Account for the positions of Tunis, Cairo, Khartum, Mombasa, Johannesburg, Cape Town

✓ 5 On an outline map, show which European powers control the various parts of Africa

6 On an outline map of British South Africa, insert the positions of the provinces, and also of the leading towns

CHAPTER XIII — AUSTRALIA AND NEW ZEALAND

1. Australia.

The island continent of Australia is another important part of our great Empire. It is nearly as large as Canada, and includes under its government the island of **Tasmania** in the south-east, and the British portion of the large island of **New Guinea** in the north-east, together with groups of smaller islands laying off the east coast. Find on the map the names of the straits which divide the islands to the north and south from the mainland.

Australia was the last of the continents to be discovered. The west coast was visited by Dutch sailors nearly 300 years ago; but it was not until about 200 years later that an Englishman, Captain **Cook**, discovered the more fertile east coast, and British people began to settle there. The first settlers found a very scanty population of rude savages, of whom only a few remain. Nearly all the five million people now living in Australia are of British origin.

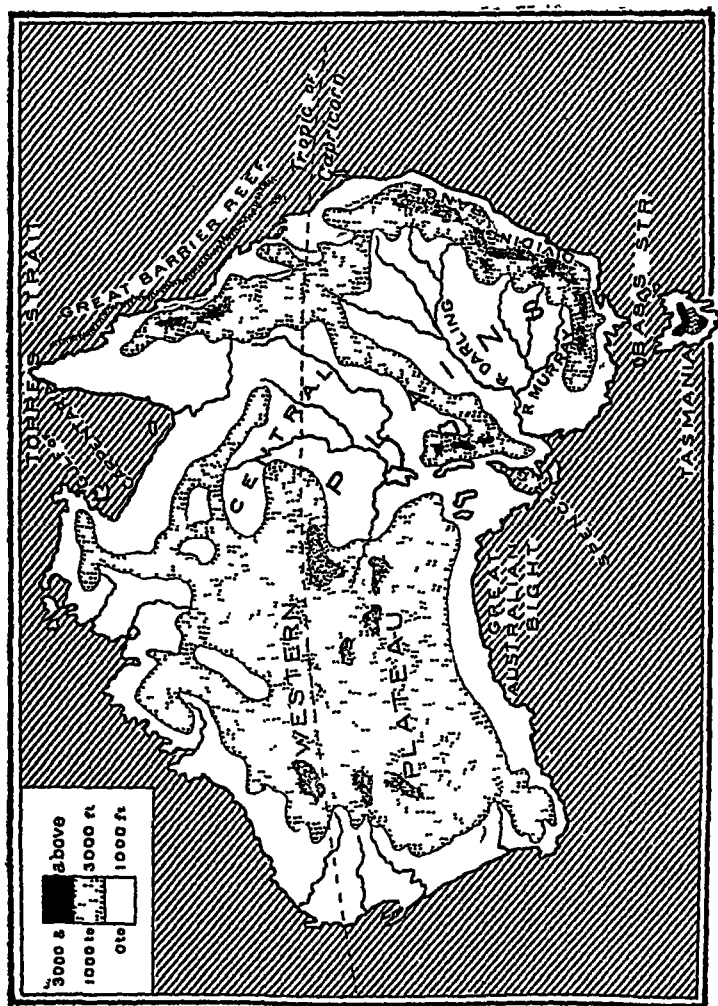
Build.—Like the two other southern continents, Australia is compact in shape, and has

a very regular coast-line. Along the shores of the Great Australian Bight there is not a single river mouth for 1,000 miles There are only two large openings in the whole coast—the Gulf of Carpentaria in the north, and Spencer Gulf in the south

The island of New Guinea rises from a plateau under the ocean which is continuous with Australia. The vegetation and animals are similar on both sides of Torres Strait

Surface and Drainage.—The map on page 166 shows the surface features very clearly. The portion left white is below 1,000 feet in elevation, you will observe that the plains lie across the centre and round the coast. The shaded portions are between 1,000 and 3,000 ft in height; they form a large plateau in the west. The parts printed black are low mountains. Thus the surface of Australia falls into three main regions—(1) the Eastern Highlands, (2) the Central Plain, and (3) the Western Plateau.

The **Eastern Highlands** are known by the general name of the Dividing Range, and you will notice that they are continued under the shallow Bass Strait into the island of Tasmania. The loftiest peak in these mountains is only a little over 7,000 ft high; so there is nowhere perpetual snow. Observe that the slope to the east is steep, and its



Physical features of Australia

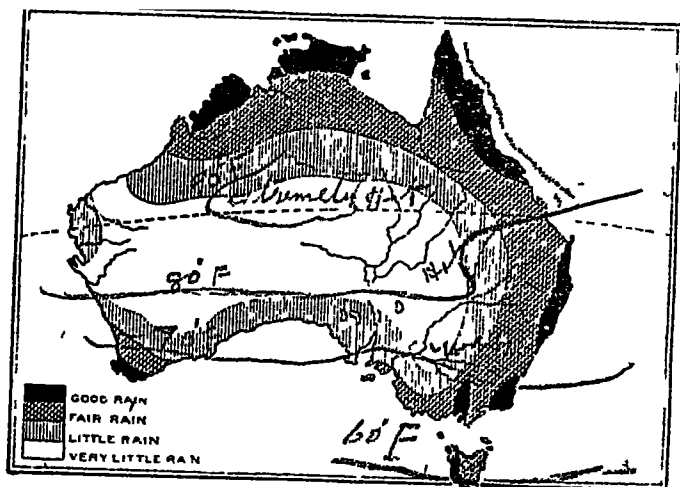
rivers short, to the west, the slope is more gentle and the rivers longer.

The **Central Plain**.—Look at the map and notice that this plain is divided into two parts by a ridge of higher land. East of the ridge is the basin of the only large river in Australia—the **Murray**, which receives the waters of a still longer river, the **Darling**. West of the ridge is an area of inland drainage, the streams flowing towards the lake district of the continent, in the south-west of the plain. These lakes, like those in the south-west of Asia, are salt, and have no outlet to the sea.

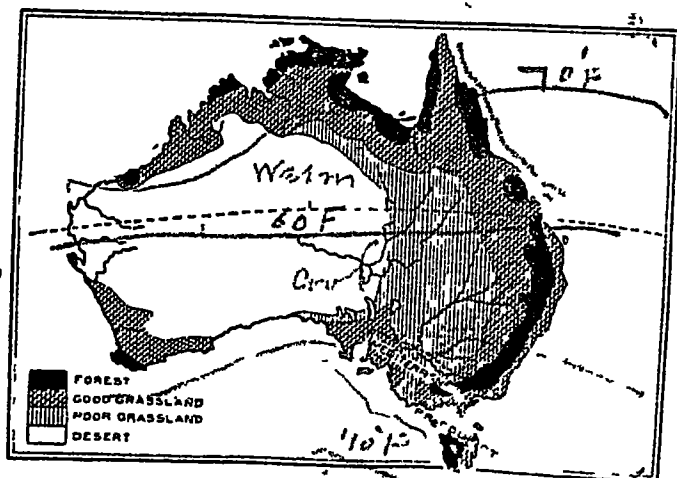
The **Western Plateau** is slightly higher at its edges than in the centre, but, as rainfall is almost absent, there are no rivers in this part of Australia. The coast plains on the west and north have short streams flowing into the Indian Ocean.

Climate.—If you have understood the climate of South Africa, you should have no difficulty in learning that of Australia, for the two areas are very similar. Both lie between the same latitudes, both consist of a plateau, with highlands to the east, and both are influenced by the sea. The climate belts in Africa, you will remember, are a region of heat and heavy rain along the Equator, succeeded by areas of (a) lower rainfall, (b) desert, and (c) Mediterranean climate.

These regions are repeated in Australia. The



Rainfall map of Australia



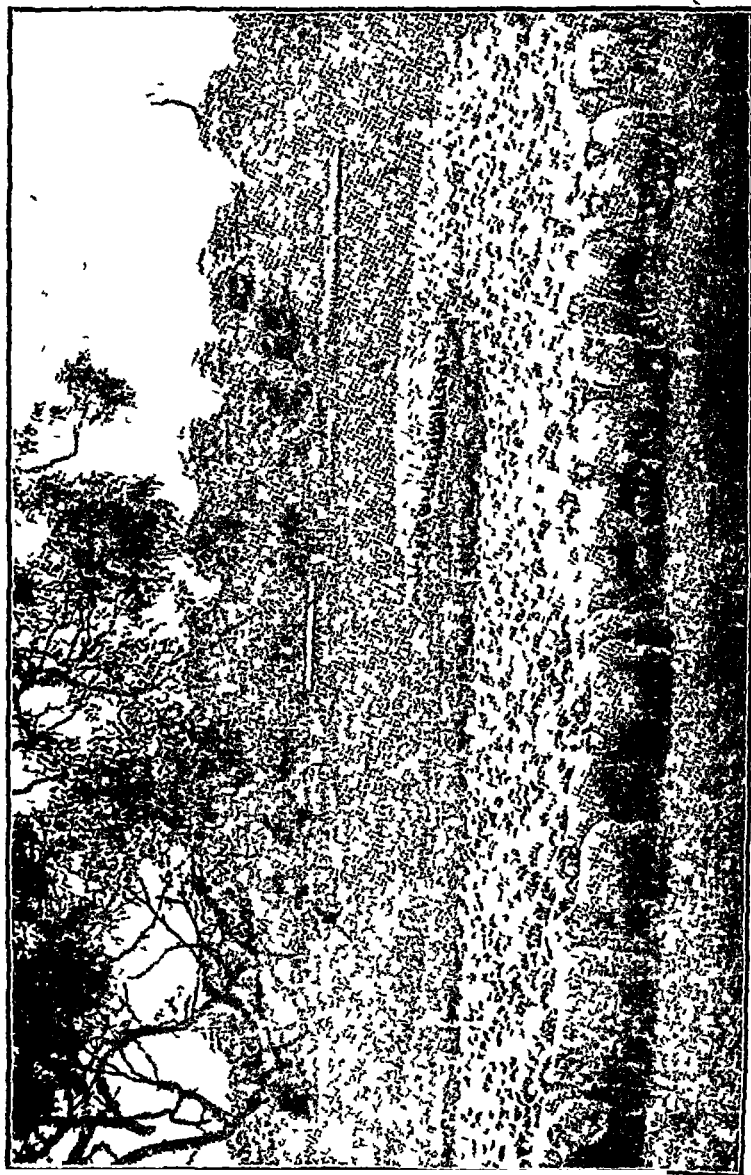
Vegetation map of Australia

points of the northern peninsulas lie in the hot rain belt, and the highlands of the east coast also get good rain from the Pacific winds. Further inland, is a curved belt, still hot, but less rainy. The western plateau and the adjoining parts of the central plain are dry, and with greater extremes of heat and cold. The districts of Australia with a Mediterranean climate are the two southern corners of the continent and the island of Tasmania. The desert area of Australia is much larger than that of South Africa. The reason for this is that the prevailing winds from the Pacific blow from the east. These winds give good rain to the eastern highlands, but, having crossed the mountains, they descend to the plain, become warmer, and blow westward as dry winds. In South Africa there is no central plain to dry the winds, which blow from the Indian Ocean.

Vegetation.—The vegetation regions of Australia are also similar to those of Africa. Corresponding to the climate belts, are regions of *forests*, *grass-land*, *desert* and *Mediterranean products*.

The forests lie chiefly in the extreme north, along the highlands of the east and in the south-west corner. The chief forest tree is the *eucalyptus*. Some varieties of this tree yield splendid timber, which is largely imported into India for railway sleepers.

The grass-lands of Australia, like those of Africa



and South America, afford pasture for many millions of sheep. Cultivation is increasing No food plants are native to Australia, and all that are now grown have been introduced from other countries. Sugar and maize are the chief crops in the north-east; wheat is grown further south and in Western Australia, and much fruit is produced in the south-east and in Tasmania.



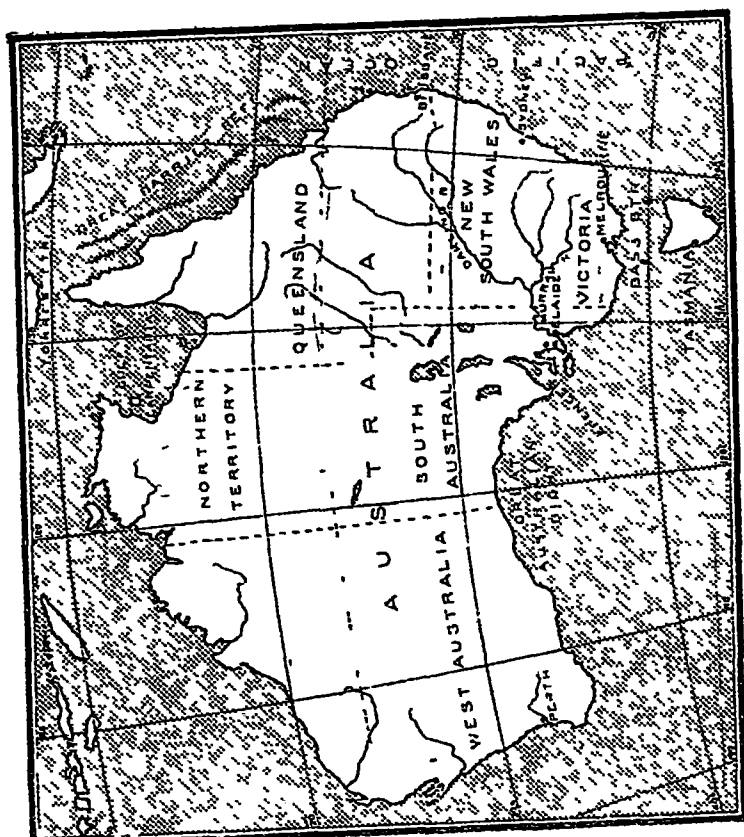
The Kangaroo.

Animals.—Australia has many animals not found in other parts of the world. The kangaroo is the best-known example of a family of grazing animals which carry their young ones in a pouch in front of the body. Another remarkable family of mammals is found, which lay eggs. Australia is also the home of the emu, a tall running bird, like the ostrich.

Provinces.—Australia is divided into six provinces. Find them on the map, and notice that nearly all the boundaries follow lines of latitude or longitude. **Queensland, New South Wales and Victoria** are in the east, **South Australia and Northern Territory** in the middle, and **Western Australia** on the west. Tasmania forms a seventh province.

Occupations.—From what you have read about the climate and vegetation of the continent, you will see that, as in South America, nearly all the people live round the coast, chiefly in the south-east.

Agriculture and sheep-rearing are the most important occupations. Some wheat is exported, but sheep-rearing is the most profitable industry. Australia stands first among the wool-producing countries of the world, and the wool is of the finest quality. Cattle are also reared on the better pastures, and much butter and cheese are



Australia.

exported Fruit-farming occupies a number of people in the southern corners and in Tasmania

Next in importance among the industries to sheep-rearing, comes mining. Gold-mining is carried on in all the provinces, but chiefly in Western Australia, Victoria, and Queensland. Gold is also the chief export from British New Guinea. The silver mines of New South Wales are important, and copper and coal mining are increasing.

Fishing is not important, for the cool seas to the south are mostly deep, but the pearl oyster is found in the shallow northern seas. The pearl fisheries of northern Australia are the most valuable in the world.

Towns.—The chief towns of Australia have risen either on the coast, or in mining centres. **Sydney**, the capital of New South Wales and the largest city and chief port on the continent, is built on one of the best harbours in the world. **Melbourne**, the capital of Victoria, is the chief port for the produce of the south-east and the present seat of the Australian government. **Adelaide**, near the mouth of the Murray River, is the capital of South Australia. **Brisbane** is the capital of Queensland, and **Perth** of Western Australia.

Questions.

- 1 Describe the surface features and drainage of Australia.

2 Compare the climate regions and the vegetation belts of Australia with those of South Africa

3 What are the chief occupations of the people of Australia, and where are they carried on ? From what ports are the products exported ?

4. “ Australia is nearly as large as Europe, but it can never support so large a population ” Why not ?

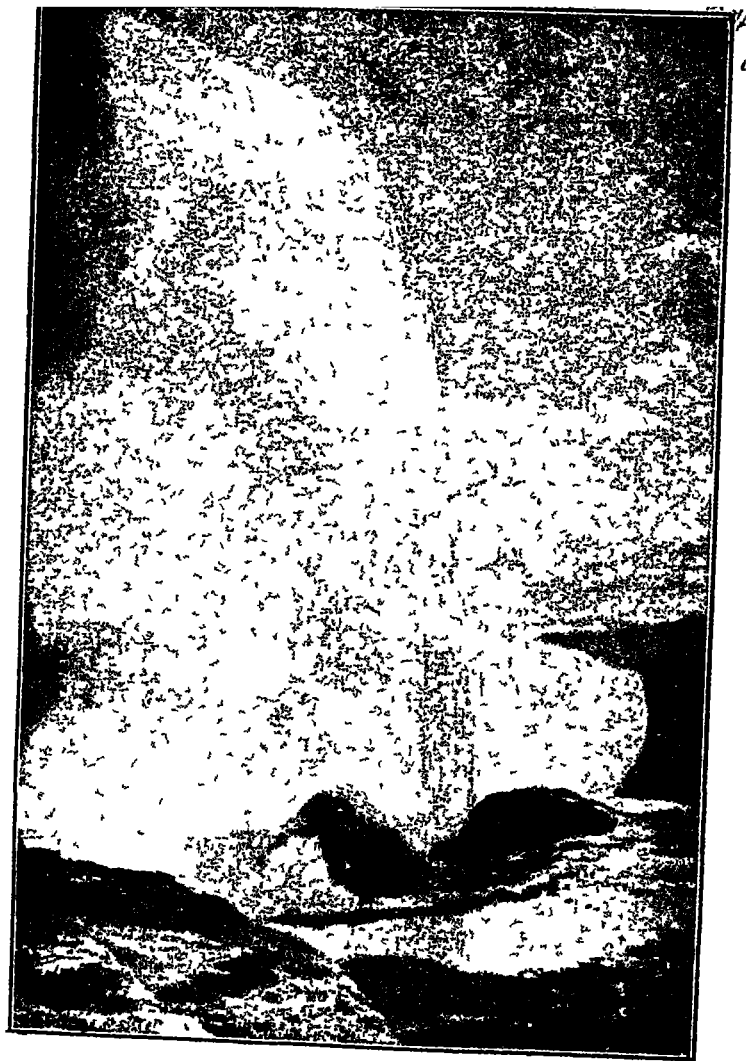
5 On an outline map of Australia, mark the physical features and chief towns Write also the names of the chief coastal features

6 On another outline map, mark the vegetation regions, with the names of the most important products

2. New Zealand.

New Zealand is another colony of the British Empire, with an area about equal to that of the United Provinces, lying about 1,000 miles east of Tasmania. Notice that latitude 40°S, which passes through Bass Strait, also passes near Cook Strait, between North and South Island This will give you some idea of the climate and vegetation of New Zealand. They are very similar to those of south-east Australia

New Zealand is very mountainous and forms the southern end of the chain of volcanic islands bordering the Pacific Ocean on the west Earthquakes are therefore not uncommon, and the islands are famous for their hot springs, called geysers, which send up hot water, like a fountain, sometimes



A. Gevse

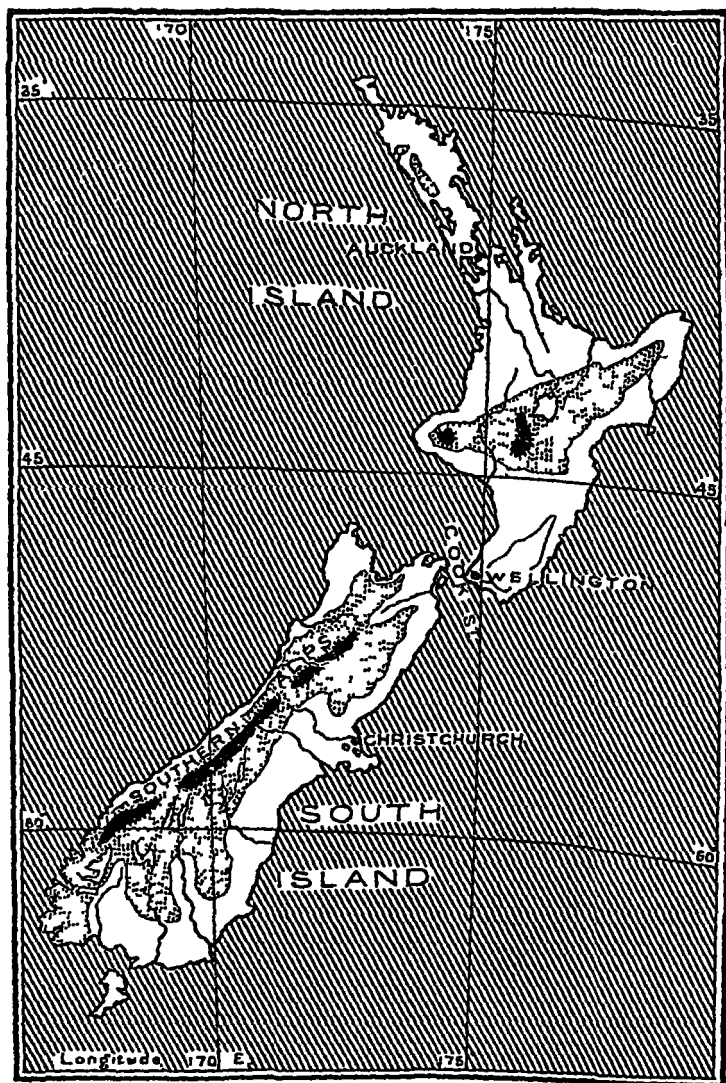
North and South Islands are very different from each other in structure. The former consists of a central knot of mountains, with arms stretching north, south, east and west. South Island is almost oblong in shape, and has a backbone of mountains extending along its length. The highest peak is over 12,000 feet in height, and the loftiest mountains are snowclad. The mountain scenery is very beautiful.

The latitude and the nearness to the sea of all parts of New Zealand make the climate and rainfall everywhere good, but as the islands lie in the belt of westerly winds, the rainfall is heavier on the west coasts than on the east.

The vegetation regions are (a) forests on the mountains, and (b) grass-lands on their lower slopes and on the plains. The forests provide excellent timber, and lumbering is an important industry; but the chief occupation of the people of New Zealand is sheep-rearing. Wool and frozen mutton are exported in large quantities to Europe. Wheat is the chief grain cultivated, and mining, especially of gold and coal, is increasing.

The British settlers live on the coast plains, and number about a million. The natives of New Zealand are called **Maoris**; they are quick and intelligent, very different from those of Australia.

The only town with more than a lakh of inhabitants is **Auckland**, on North Island, a very



New Zealand.

flourishing port, on a good harbour The capital of the colony is **Wellington**, well situated on Cook Strait, at the middle point of the two islands The largest town on South Island is **Christchurch**, in the centre of an important sheep-rearing area

Questions.

- 1 How do North and South Islands in New Zealand differ from each other in structure?
- 2 Compare the climate and products of New Zealand with those of south-east Australia
- 3 On an outline map of New Zealand, insert the highlands and write in their proper places Cook Strait, Auckland, Wellington, Christchurch.

CHAPTER XIV — PHYSICAL GEOGRAPHY.

The Solar System.

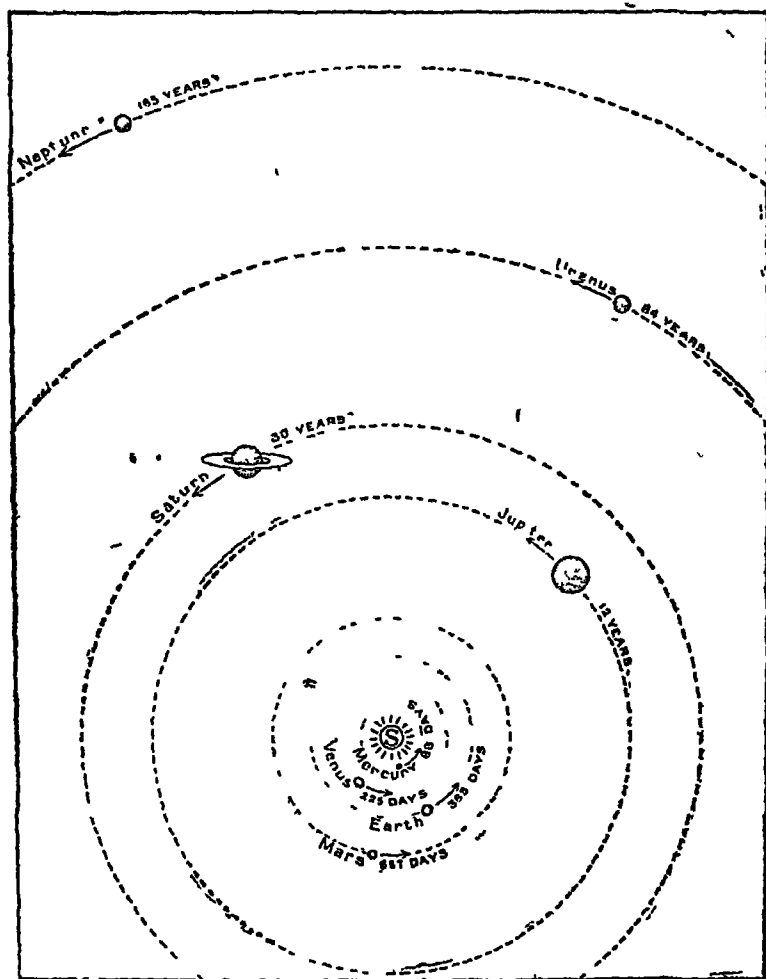
You have often looked at the sky on a clear cloudless night, and have seen the thousands of stars which appear as specks of light in the darkness; but have you ever thought that nearly all those stars which you see are really suns, as large as or larger than the great Sun, which gives light and heat to the Earth every day? The reason why the stars appear as mere specks of light is because they are all at such vast distances from us. Some are so far away that they cannot be seen at all with the naked eye; they can only be brought into view by the aid of a telescope, and the higher the power of the telescope, the greater the number of stars which can be seen.

The Sun, then, is the nearest star to the Earth; it is, indeed, the centre of the group of heavenly bodies to which the Earth belongs. You probably know already that the Earth revolves round the Sun in a great path or orbit, taking a year to complete the journey. The Earth is not the only body which revolves round the Sun, there are seven others, which perform a similar journey at greater or less distances, in orbits which are nearly circular, and nearly parallel to one another. These eight bodies

which revolve round the Sun are called planets, and the whole group or system, consisting of the Sun, the planets, and other lesser bodies, is called the Solar or Planetary system. Let us consider some of the members of the system separately

The Sun is to us the most important of all the heavenly bodies, for it gives us light and heat, upon which life so largely depends. It is impossible for us to imagine the heat of the Sun. We think its rays are hot in the summer, but we really feel very little of the Sun's heat, for it is nearly a hundred million miles away from us. It is so hot that all the substances of which it is composed are maintained in the gaseous state. The Sun is also of enormous size. It would be of little use to tell you its diameter in miles, for the number might not convey any real meaning to you, but you can form some idea of the great size of the Sun in comparison with the Earth, by taking a little ball or marble, $\frac{1}{2}$ an inch in diameter, to represent the Earth, and a globe, with a diameter of 4ft 6in., to represent the Sun. If you wish to represent the distance between the Earth and the Sun on the same scale, you must place these two objects 500 feet apart.

The planets which have so far been discovered are eight in number. Beginning from the Sun, their names are **Mercury, Venus, Earth, Mars,**



The Solar System

Jupiter, Saturn, Uranus, and Neptune. Thus five, called the superior planets, are farther from the Sun than the Earth, the remaining two are

nearer, and are called inferior planets. The planets vary very much in size, in their distance from the Sun, and in their period of revolution (see diagram on previous page), but they are similar in the following important particulars :

(a) They are all globular in shape.

(b) They each rotate on an axis.

(c) They all revolve round the Sun

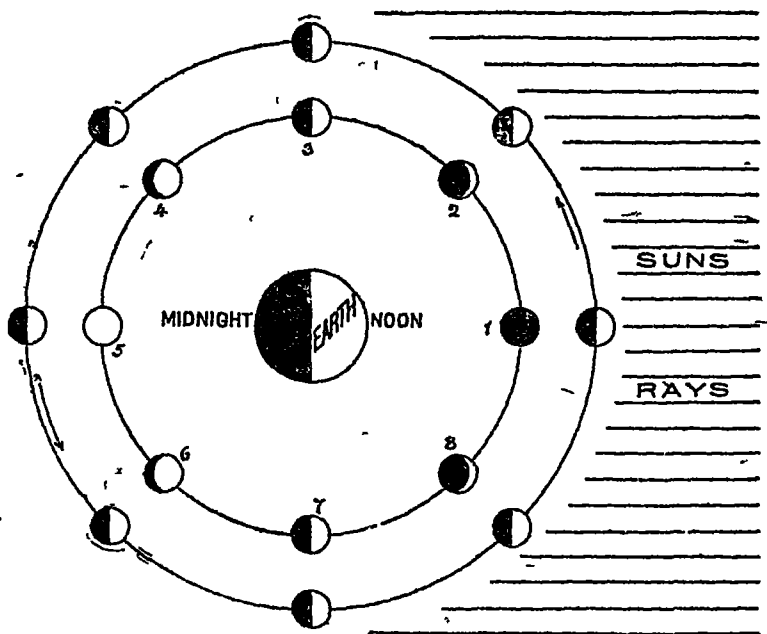
(d) They are all cooling bodies ; they have no light of their own, but shine by light reflected from the Sun

The Moon.—Just as the planets revolve round the Sun, so most of the planets, in their turn, have attendant bodies, or moons, revolving round them.

The Earth has one Moon, which revolves round it in a month. Although the Moon appears so large in the sky, it is really the smallest of all the heavenly bodies which are visible to the naked eye. Its apparent size is due to the fact that it is also the nearest.

You have often noticed the changes in the appearance of the Moon which take place every month. It first appears as a thin crescent, and then gradually increases, until, in a fortnight, it is a full circle of light. It then gets smaller again, until it finally disappears about a month after it was first seen. The explanation of these phases of the moon will appear from the diagram on the next page.

The central figure represents the Earth. The outer circle of figures represents the Moon at different positions during the month. Only the half turned to the Sun is bright, the remaining half is dark and invisible. The middle line of figures shows the appearance of the Moon—as seen from the Earth. In the position 1, the bright half is turned away from the Earth, and the Moon is therefore not seen at all, it is called **New moon**.



Gradually, the illuminated half appears and waxes or grows in size, until at position 5, the whole of the bright side is seen from the Earth, when it is

called **Full moon**. After full moon, the bright half gradually turns away again, and the Moon wanes or grows smaller, until new moon comes round again.

Shape of the Earth.

A boy who lives on the plains of India might think that the Earth's surface is flat But, as we



have said above, the Earth is globular in shape. The reason why the Earth appears to us flat and not curved, is that our size is so small, compared to that of the Earth, that we can see only a very small portion of its surface at a time. If an ant were walking on a large ball, the surface of the ball would appear to it to be flat, because the ant would be able to see only a small portion of the surface of the ball at one time. If a man could get very high up in the air, thousands of miles above the Earth, and see it through the clouds, its shape would appear to him to be as in the picture on the previous page.

There are several proofs that the Earth is round like a ball. One proof is that men have travelled round the Earth. They have started from their homes and journeyed on and on for weeks and months without turning back, and at last have found themselves at the place from which they started. If the Earth had been flat, they would have come to an edge somewhere.

The movements of the Earth.

The Earth is constantly moving. It has two chief movements—a spinning motion on its axis, and a forward motion in a great path, almost circular, round the Sun. These movements divide time for us into regular periods. The Earth turns once

round on its axis in a day, and the time it takes to travel round the Sun we call a year.

Let us learn a little more about these two movements. Place a lamp at the centre of a table to represent the Sun, and a globe at one end of the table to represent the Earth.

Morning, Noon and Night.—Place the globe, so that the north end of the axis points over the lamp, and let India be turned away from the light. In this position India has **night**. Now turn the globe slowly in a direction from west to east, i.e., opposite to the motion of the hands of a watch lying on the table, until India just comes into the light of the lamp. When the Earth is in this position, India is just getting the light of the Sun we call it **morning**, and you will notice that the Sun is in the east. Continue to turn the globe slowly in the same direction, and observe that the Sun is getting more and more overhead, until it shines directly over India. This is the position at **noon**. As you still turn the globe, the lamp gets more and more to the west, until it reaches a point where it no longer shines upon India at all. We then say that the Sun has set and night has again begun. Thus you see that what looks like a movement of the Sun across the sky every day, is really due to the rotation of the Earth.

The Seasons.—From what you have read,

you have realized that the most important feature of all the members of the Solar system is their revolution round the Sun. In the case of the Earth, this motion has most important effects, which it is very necessary that you should study further.

Place a lamp at the centre of a table to represent the Sun, and a globe at one end of the table to represent the Earth. Observe how the globe is mounted. The axis on which it turns is slanting. This slanting of the Earth's axis is most important, and you must remember it very carefully. You



Winter in the
northern hemisphere.

Summer in the
northern hemisphere

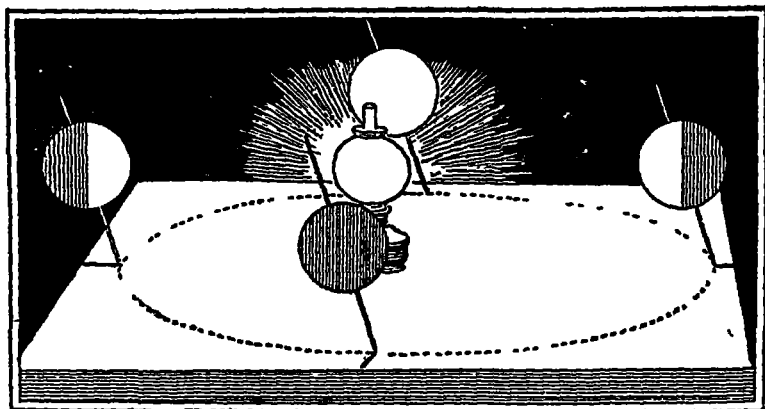
must also remember that the *direction* of the axis does not change. As the Earth travels round the Sun, the axis always points to the same spot in the sky. Let the globe be so placed, then, that the axis points over the lamp. Now rotate the globe and say, whether a place in the northern hemisphere is longer in light or in darkness. Answer the same question, with regard to the southern hemisphere. The northern hemisphere has longer days than nights, and the southern hemisphere longer nights than

days. India is in the northern hemisphere. At what time of the year are the days longer than the nights?

This you know occurs in the summer. The position of the globe, then, that you have just studied, corresponds to our summer, and you learn that, while countries in the northern hemisphere are having summer with long days and short nights, the countries of the southern hemisphere are having winter with short days and long nights. Before you move the globe, rotate it once more and notice that in this position, the North Pole gets no night at all, and the South Pole, similarly, gets no day. Now place the globe at the other end of the table, taking care to keep the axis in the same direction. Its northern end now points away from the lamp. If you rotate the globe in this position, you will see that the lengths of days and nights and the seasons are exactly opposite to those in the first position. In this position the North Pole has continuous night and the South Pole continuous day, the northern hemisphere has winter with short days and long nights, and the southern hemisphere has summer with long days and short nights.

If now the globe be placed on either side of the table, half way between the positions already taken, and the axis be kept in the same direction,

you will see that the light of the lamp reaches exactly to the North and South Poles, and if you rotate the globe, you will see that any point on its surface has exactly the same period of light and darkness. In these two positions days and nights are equal all over the world, and the amount of heat received from the Sun is equal in the two hemispheres.



You can now move the globe right round the lamp, and see how the area of sunshine changes throughout the year in each of the hemispheres. In performing these experiments, you must take care to keep the axis of the globe constantly pointing in the same direction.

Questions.

1 What do you understand by the Solar System? Of what members is it composed?

2 What is a planet? In what respects are all the planets similar?

3 Explain the different appearances of the Moon in the course of the lunar month. Illustrate your answer by a diagram.

4 Explain the cause of the sequence of day and night.

5 Why does the amount of light and heat received at any place vary at different times of the year?

6 Draw a diagram to represent the members of the Solar System, in the order of their distances from the Sun.

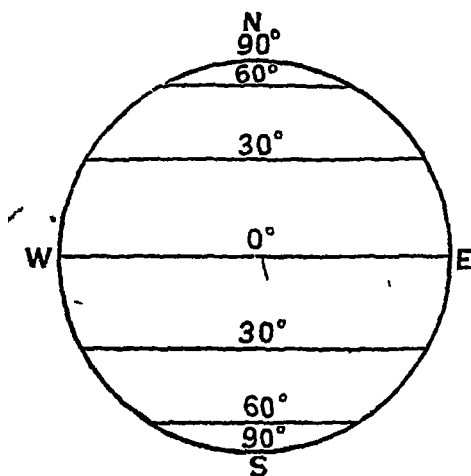
7 Draw a diagram to represent the position of the Earth, with regard to the rays of the Sun, in January and June.

Latitude and Longitude.

In the course of what you have read in this book you have often been asked to find a certain place on the map or globe, and we dare say you have not found very much difficulty in pointing out the places mentioned. But if a globe were placed before you, and you were asked to find a place of which you had never heard, your task might not be so easy, unless you had some information about its position to guide you. So you see it is necessary in your map-study to have some means of fixing position on the Earth's surface.

If you were asked to fix the position of any letter on this page you could do it easily; for you could

measure its distance from the top edge of the page and then from the side, or you might draw lines through the letter parallel to these two edges, and say the letter is at the point where the lines cut each other. On a flat piece of paper, then, it is easy to fix the position of a point, by measuring from its edges, but can the same method be applied to a globe which has no edges?

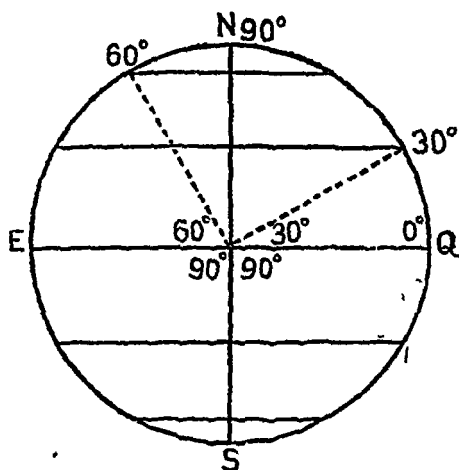


Lines of latitude

The Earth is a globe, and has no edges, but it has two fixed points—the North and South Poles, the ends of the axis on which it turns, and it has also a fixed line—the **Equator**, which is the circle drawn midway between these points. Find the Equator on the globe, and observe that other circles are drawn parallel to it, to north and

south, and that these circles get smaller, as we go from the Equator to the Poles. They are called Lines of Latitude. If you look carefully, you will see that the circles are numbered, the Equator being marked 0, and the numbers increasing on both sides of it to 90 at the Poles. The latitudes near the Equator are therefore called low latitudes, and those near the Poles high latitudes.

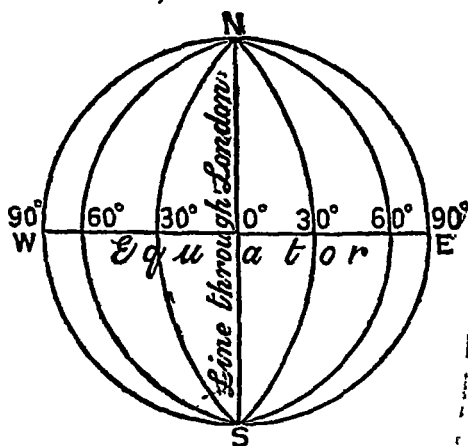
Now, what do these numbers mean? Look at the diagram below. What kind of angles are



formed by the two lines, NS and EQ? They are four right angles, and a right angle contains 90 degrees (written 90°). So, if N and S represent the North and South Poles, and E and Q two opposite points on the Equator, you can see how the quarter circumference, from the Equator to either of the

poles, comes to be divided into 90 degrees. Each of the numbers between 0° and 90° occurs twice, once to the north, and again to the south. The former lines are called north latitudes, and the latter south latitudes. Thus you will find Pekin on the line marked 40° on the globe, and as it is to the North of the Equator, we say that Pekin is on 40° north latitude.

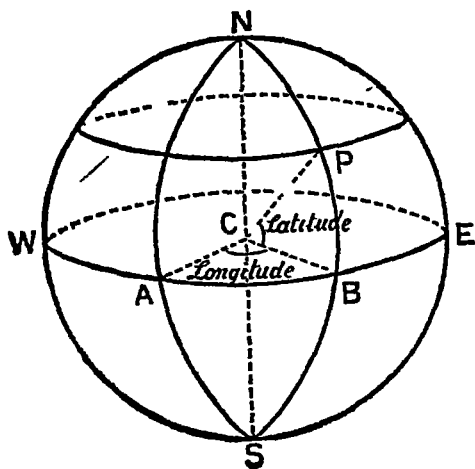
But latitude gives us distance or position in only one direction, and we saw above in finding the position of a letter on a page that we must measure in two directions. It is of little use to say that a place is on a certain line of latitude, if we are unable to say whereabouts on the line it is. In other words, we must be able to measure east and west, as well as north and south. As the Equator is a circle, it can be divided into 360 degrees; and



Lines of longitude.

through each of these divisions circles can be drawn, passing through the poles. Look on the globe, and find these circles. They are called **Lines of Longitude, or Meridians.**

You will see that these lines are also numbered. Find the line numbered 0° . It passes through London, and it is the line from which all the others are reckoned. Count the numbers round the globe. The lines of latitude were numbered from 0° to 90° , but the lines of longitude are numbered east and west of 0° , up to 180° , and you will see, if you look carefully, that the line marked 0° and that marked 180° make up one complete circle. From this you learn that lines of longitude are only half circles, while lines of latitude are complete circles. Lines east of London are called East longitude, those west of London are called West longitude. Look on the map or the globe for the longitude of Madras. It is marked 80° , and it is east of London; it stands on the line 80° , East longitude.



Lines of latitude and longitude

Look at the diagram on the previous page N A S is the line of longitude through London. W A B E is the Equator

The angle P C B is the latitude of P, the angle A C B is its longitude

You can now fix the exact position of any place on the Earth's surface, for you have only to name its latitude and longitude. The numbers of the degrees are generally given on the edge of a map. You should remember that places on the same line of *latitude are always due east and west of each other*, and places on the same line of longitude due north and south. You can see this very plainly from the globe.

Let us now put what we have learned into a short form

Lines of Latitude	Lines of Longitude
1 Are drawn east and west	1 Are drawn north and south
2. Are complete circles	2 Are half-circles
3 Are of different lengths	3 Are of the same length.
4. Are parallel to each other	4 Are widest apart at the Equator, and meet at the poles.
5 Are numbered from 0° to 90°.	5 Are numbered from 0° to 180°

Questions.

- 1 How can the position of a place be fixed on the globe ?
- 2 What do you mean by lines of latitude and longitude ? How do the former differ from the latter ?
- ✓ 3 Draw a diagram to represent lines of latitude and longitude
- ✓ 4 Find from your atlas the position, by latitude and longitude, of Madras, Aden, Singapore, Hong-kong, Pekin
- ✓ 5 Find a town in Arabia almost due west of Lahore
- 6 Along which line of latitude is the breadth of Asia greatest, and along which line of longitude is the greatest length ? Measure these distances, using the scale of the map of your atlas

Longitude and Time.—The Earth turns completely round on its axis in one day. It thus, turns through 360° in 24 hours, *i.e.*, 15° in 1 hour, or 1° in 4 minutes

It is midday at a particular place when the line of longitude through that place comes directly opposite the Sun (see page 187). Now, the Earth rotates from west to east. Hence when it is 12 o'clock at Allahabad it is 4 minutes past twelve at a place 1° east of Allahabad, and 4 minutes to twelve at a place 1° west of Allahabad.

Let us work out the difference in time between some places

What is the time at Calcutta when it is 10 A.M. at London ? Look at your atlas, you will find that

the longitude of Calcutta is approximately 90° E. Hence, when it is 10 A.M. at London, it is nearly 90×4 minutes (or 6 hours) past 10 A.M., i.e., it is 4 P.M. at Calcutta.

What is the time at Quebec when it is 4 P.M. at Cape Town? The longitude of Quebec is 71° W., and the longitude of Cape Town is nearly 18° E. Hence Quebec is 89° west of Cape Town, and when it is 4 P.M. at Cape Town it is 89×4 minutes (or 5 hours, 56 minutes) before 4 P.M., i.e., it is 10-4 A.M. at Quebec.

It would be very inconvenient if every place set its clocks by Sun time, that is, the time when the line of longitude through the place comes directly opposite the Sun. So all the places in a particular country or part of a country agree to set their clocks according to the time of one particular line of longitude. Thus all places in Great Britain agree to take their time from London, i.e., from 0° longitude; North America is divided from east to west into four sections for time, 'Eastern,' 'Central,' 'Mountain,' and 'Pacific;' these keep respectively times of the lines of longitude 75° W., 90° W., 105° W. and 120° W.

In India, the time of the line of longitude $82\frac{1}{2}^{\circ}$ E, which, as you will see from your atlas, is about the central meridian, is the standard time for railway and other purposes; but Calcutta (except the railway

station) adopts the Sun time $88\frac{1}{2}^{\circ}$ E, which is its longitude; hence clocks at Calcutta are 6×4 minutes, i.e., 24 minutes faster than clocks at other places in India

Questions.

1. When it was noon in London, was it afternoon or morning in America? Was it afternoon or morning in Egypt?

2. In a certain town at noon London time is 9 A.M. Find the longitude of the town

3. The standard time in Ireland is that of Dublin (longitude $6^{\circ} 15' W$) How many minutes are clocks in Ireland fast or slow as compared with clocks in England?

4. How much must a traveller alter his watch in travelling from London to New York?

5. When it is 6 P.M. at London, what o'clock is it at New York, Constantinople, Peking?

6. The following standard times have been adopted for railway and other purposes, with reference to time at London. Find in each case the line of longitude which has been adopted as the line for standard time.

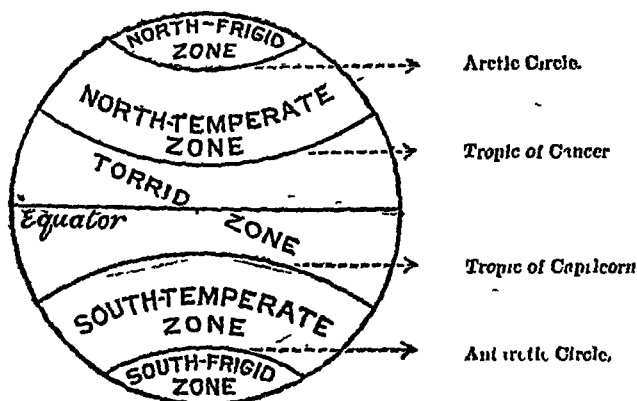
Mid Europe, 1 hour fast; Egypt, 2 hours fast; Japan, 9 hours fast; Iceland, 1 hour slow.

7. A cricket match played at Adelaide finished at 6-30 P.M. (Adelaide time). The result was published in London newspapers early in the same afternoon. Explain clearly how this was possible.

8. The captain of a ship finds that the Sun reaches its highest point in the sky for a particular day when his watch, keeping London time, indicates 5-20 P.M. His latitude is $4^{\circ} N$. Near what island is he sailing?

Zones.—So far you have learned of one line of latitude which has a special name, that is, the Equator. But if you look at the globe, you will find four others. They are the **Tropic of Cancer**, $23\frac{1}{2}$ degrees north of the Equator, and the **Tropic of Capricorn**, $23\frac{1}{2}$ degrees south of it, and the two polar circles, the **Arctic Circle** $66\frac{1}{2}^{\circ}$ North, and the **Antarctic Circle** $66\frac{1}{2}^{\circ}$ South. These lines divide the surface of the Earth into five portions. They are called the five zones.

The portions of the Earth's surface within the Arctic and Antarctic Circles are always very cold, and generally covered with snow and ice. They are therefore called the **Frigid Zones**.



The Zones

The next two belts, which lie between the polar circles and the tropics, generally enjoy a mild climate, neither very hot nor very cold. They are, therefore, called Temperate zones—the **North Temperate Zone**, and the **South Temperate Zone**.

And, finally, the central belt between the two tropics is the hottest part of the Earth's surface, and is therefore called the **Torrid Zone**. One peculiar feature of the Torrid Zone you should remember. In the middle of it, that is, along the Equator, there is always good rain all the year round, while at the edges of this zone, that is, along the tropics themselves, we find the region of hot desert, where very little rain falls. The largest desert in the world is the *Sahara* in Africa; and, if you look at the globe, you will see that the Tropic of Cancer passes through the middle of it.

Questions.

1 What are the Tropics and the Polar Circles? Where are they situated? Into what zones do they divide the Earth's surface?

2 Describe the general climate of the Torrid Zone

The Land Surface of the Earth.

A glance at the globe will show you that there is a great deal more water than land on the Earth's surface, in fact, about two and a half times. The outside of the solid crust is very uneven. On the land, there are plains and plateaux, hills and mountains ; and the same may be said of the ocean floor, the tops of the highest mountains in this case appearing above the water as islands.

Maps are often coloured to show heights. One colour is used for plains and another for highlands, and different shades of blue are used to show different ocean depths. But you must know how these heights and depths are measured. What do we mean when we say that Mt Everest is 29,000 feet (or nearly $5\frac{1}{2}$ miles) high ? We mean that its topmost peak is 29,000 feet above the level of the sea. The water of the ocean keeps one level, just as the water in a bowl does ; and all heights and depths are measured from this level.

Let us consider the great plain of Northern India. It is not level. It cannot be ; for, if it were, the rivers would not flow. Water always flows towards a lower level. Hence, following the Ganges, we find that Calcutta is 20 feet above sea-level, Allahabad 300 feet, Agra 550 feet, and Roorkee 900

feet above the sea. Yet these towns are all on the plains.

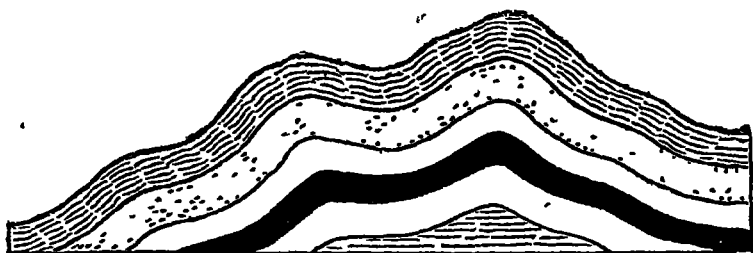
In the same way, turning to the valley of the Indus, we find Karachi is 30 feet, Multan 400 feet, Lahore 700 feet, and Peshawar 1,100 feet above sea-level. You need not remember these numbers, but you must remember from what level heights are measured, and that plains, as well as mountains, have a slope. The slope of a country may be found by studying on the map the courses of its rivers.

Let us now enquire how the Earth came to have this uneven surface. If you were to go down into a deep mine, you would find it much warmer at the bottom than at the top. The deepest mine that has ever been dug does not go more than a mile below the surface; but it is believed that at a depth of forty or fifty miles it is hot enough to melt into a liquid every known solid substance, just as iron is melted in a furnace.

What does this teach us? Men who have made a study of the question tell us that many millions of years ago the Earth was a very hot molten globe, just as the Sun is now. Very gradually it cooled down; and, as this went on, the outside became solid, the inside remaining very hot, as it is now. The solid rock, which was thus formed, is called *igneous* or *fire-formed rock*. We do not find this kind of rock

on the plains of northern India, for reasons which we shall see presently, but there is a good deal of it in the Deccan.

When a substance cools, it shrinks, and when the Earth began to cool, it began to shrink too. Put an apple into a pan and roast it. While it is hot, the apple remains round and smooth; but as it cools, you will notice that it shrinks and its surface becomes wrinkled and uneven. This is exactly what has happened in the case of the Earth. Its surface is now uneven. There are vast hollows which are filled with the waters of the ocean, while of the dry land some is low and flat, and other portions are higher, having been lifted in big masses to form tablelands, like the Deccan, or folded into mountain ranges, like the Himalayas.



Long ages ago, then, the surface of the Earth consisted entirely of igneous rock, but in course of time, this has changed, for we now see soil and

sand as well as solid rock How have these changes taken place?

(a) The weather causes change Have you ever seen an old building, with its bricks or stones crumbling away? This crumbling is due to the weather. The heat and the cold and the rain wear away the solid building. In the same way, hard rocks are broken up and worn away by the weather.

(b) The wind causes change, for it blows the fine particles of dust and sand from one place, and they settle in another. If you could pay a visit to a sandy desert, you would find low hills which have been formed in this way by the wind.

(c) Water also causes change. You have all noticed that the water of a stream or river is nearly always muddy. Particles of sand and mud are carried along; and, if the river overflows its banks, they settle on the land, and if not, they fall to the bottom, when the rate of flow is slower. The sea also causes changes. It wears away the land in some places, and builds it up in others.

(d) Frost causes change. When water freezes, it turns to ice, and, as it does so, it expands. The cracks in rocks are often filled with water after rain, and when this water freezes, the force of expansion is sometimes strong enough to break off.

little pieces, which can be carried away by the wind or the rain

(e) Change is also caused by the roots of trees and plants, or by worms and burrowing animals. These break up the rocks and form the soil, which covers the land surface of the Earth Soil is the most important of all rocks, for it is that which feeds the vegetation on which men and animals live You must remember that the word rock refers to every kind of solid substance of which the Earth's crust is formed, whether it is large or small, hard or soft.

Of all these causes of change, water is the most important You know already that rivers fill up the sea near their mouths, and you can understand also that the bottoms of lakes and of the ocean are very slowly but constantly rising, on account of the solid matter which is poured into them The whole of the great plain of northern India has been built up of silt brought down from the mountains

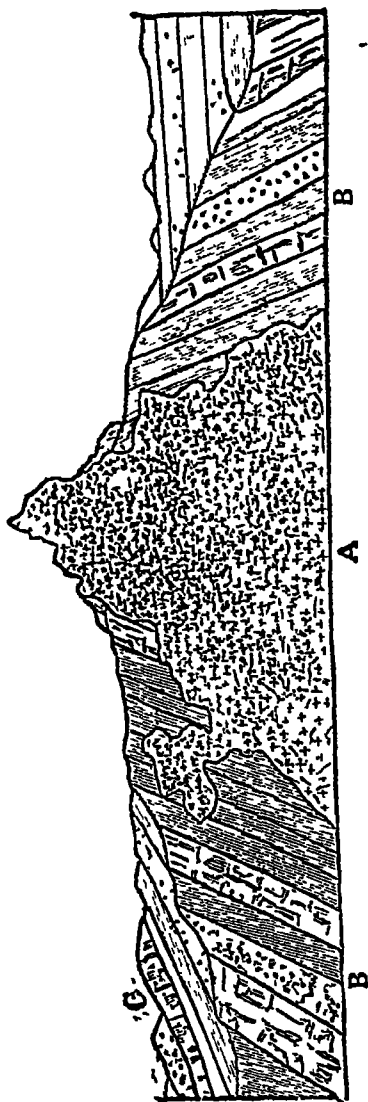
You can easily understand that mud laid down in this way settles in layers, and that, as the layers get thicker and the weight above increases, the lower parts are pressed into stone Thus layers of sand are pressed into sandstone, layers containing lime or chalk become limestone, and so on.

Here, then, we have another kind of rock.

This is called *aqueous* or *water-formed rock*.

It is always in layers, which may be quite level, but which may be found slanting if the shrinking of the Earth has caused them to fold or wrinkle. You can tell to which of the two classes a piece of rock belongs, by breaking it with a hammer. If it is a water-formed rock, it will split and you will see flat surfaces; if it is a fire-formed rock, the fragments will be quite irregular in shape.

The changes of which we have just spoken are constantly going on, you can see them when the wind blows or when you look at a muddy stream. But



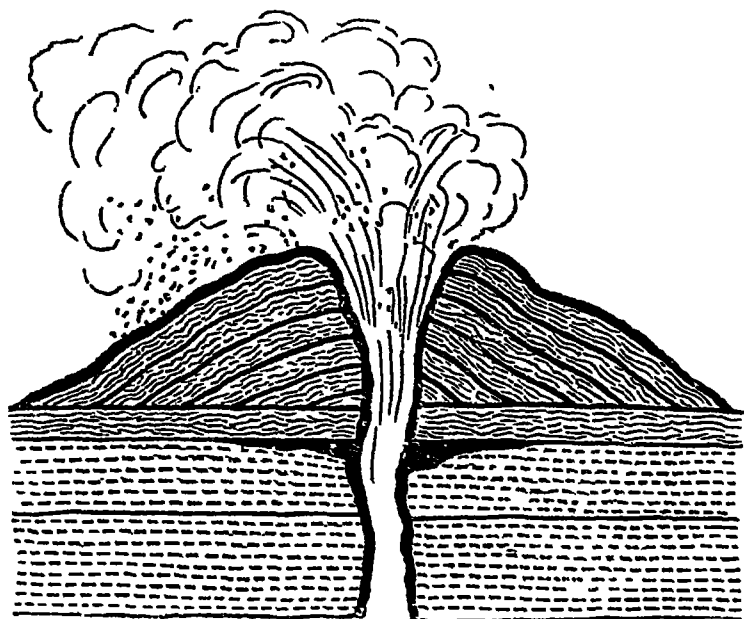
A Fire-formed rock.
B, C Water-formed rock.

is the shrinking of the Earth still going on? Is the shape of its surface still changing? Yes, it is; but it goes on so very slowly that you cannot see it. Sometimes, however, the movement is severe enough for you to hear of it, or even to feel it.

✓ What is an earthquake? It is a movement of the Earth due to a shrinking of the crust at a particular place. You may not be able to see much change in the appearance of the surface after the earthquake, and this is very easy to explain. Considering the great size of the Earth, the movement was very slight, had it been violent enough to cause great changes, no one living in the neighbourhood would be left alive to tell the story.

1 The action of a *volcano* is also due to Earth movement. A volcano is sometimes described as a burning mountain, but this is not quite correct. The one thing necessary to form a volcano is an opening like a pipe in the solid crust of the Earth, so that when shrinking takes place, the hot molten matter inside the Earth is forced out along with masses of rock and clouds of steam and deadly gases. The solid matter which is thrown out flows or falls all round the opening, and a mountain is gradually built up which, as you see from the diagram opposite, will be in the form of a cone.

Take a globe and look at the borders of the Pacific Ocean. Put your finger at the southern end



Section of a Volcano

of South America, and trace the high mountain ridge, which extends along the whole of the western side of both the American continents. Now continue along the other side of the Pacific, down the great island chain, and through the East Indies to New Zealand.

The line you have traced contains over 200 volcanoes, or more than two-thirds of all the volcanoes in the world. You will notice that it is a line of mountains, which rise in America above the dry land, and, on the other side of the Pacific, out of the ocean-floor.

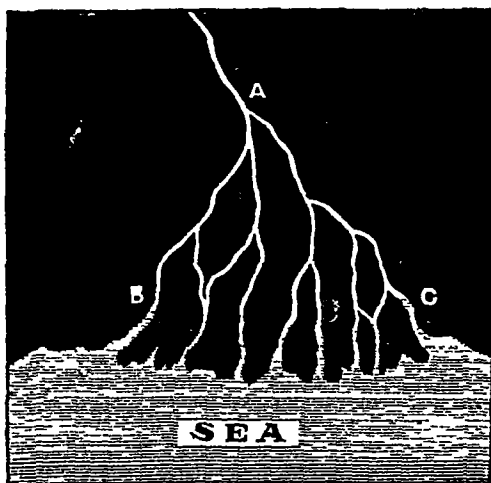
The work of rivers. Rivers generally rise in mountains, either from springs or from the melting of snow and ice Every mountain valley has its stream, at first small, but growing in size as it receives other streams; and these unite to form the rivers which enter the plains. In their mountain stage, rivers are usually rapid, and their chief use is to float down the timber which is cut down in the mountain forests.

The rate of flow is slower in the plains stage, and here rivers are often very useful. You know that the Ganges, for instance, supplies water and fertile soil for cultivation, and that the Indus provides water for canals to irrigate land which would otherwise grow no crops. Boats can also ply on rivers; from ancient times they have been great highways of trade. Hence important towns are found on their banks.

The third stage of a river is its mouth, which may be a **delta** or an **estuary**. If the current is slow, mud is deposited at the mouth, and this part of its bed is gradually filled up. This causes the stream to make a new mouth for itself. In course of time there may be several such mouths, as in the case of the Ganges. The name delta is given to the region lying between the point where the river begins to split up (marked A on the sketch) and its most widely separated mouth (marked B

and C) *Delta* is the name of a letter of the Greek alphabet, shaped Δ Look on the map, and see how many Indian rivers have deltas.

Where the current is more rapid, the river carries the mud right out to sea, and no new mouth is formed A single wide mouth is called an *estuary*.



Questions.

1. What do you mean by the term sea-level? Explain the expression 'the surface of the lake at Naini Tal is at a height of 6,350 feet.'

2 How do you account for the unevenness of the Earth's surface?

3 Describe the ways in which the two chief kinds of rocks have been formed.

4 How is the surface of the Earth changed by (a) weather, (b) water?

5 What is a volcano? Where are the chief volcanoes of the Earth situated?

6 How are deltas formed?

7 Describe the course of the Ganges, showing how it is divided into three well-marked stages, and state what work is done by the river in each of these stages

8 Examine a number of pieces of stone, and say of each to which class of rock it belongs

Rainfall.

The teacher will heat some water in a flask
The heat of the spirit lamp turns the water into



vapour This vapour is an invisible gas, you do not see it passing through the neck of the flask or through the small tube The capacity of air for water-vapour depends on the temperature of the air When the air contains as much water vapour as possible, it is said to be saturated If saturated air be cooled, its capacity for water-vapour will be decreased and the excess of water-vapour will be deposited as water it is said to be condensed Thus when the vapour from the flask reaches the cold air, it is condensed, and you see it as a small cloud near the mouth of the tube If the teacher will hold a second spirit lamp near this cloud it will disappear, it again becomes turned into invisible vapour, because the warmed air has a greater capacity for vapour than the cold air If the teacher will hold a glass or a slate near the mouth of the tube, the vapour coming from the flask will quickly condense into drops of water when it reaches the cold glass or slate

You know that if you hang a wet cloth in the Sun it becomes dry, the water *evaporates*, i.e., it turns into water-vapour In the same way, the heat of the Sun is continually evaporating the water in the sea, rivers, lakes, and other water regions over the surface of the Earth

This water vapour is carried by currents of air high up above the surface of the Earth When air

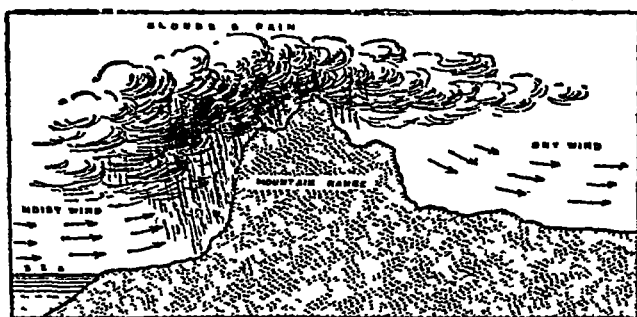
risers it cools. The reason is that the higher it goes up the less compressed it is by the weight of air above it, and so it expands. Expanding air always cools. Open the valve of a bicycle tyre and let the escaping air blow against your hand. The air feels cold ; it has been cooled by expansion.

(When ascending air containing moisture is cooled by expansion at high altitudes, the water vapour condenses into tiny drops, these drops form clouds. If the quantity of condensed water is great, the drops run together and form larger drops which are too heavy to float in the air ; these fall to the ground as rain. If the air from which the water vapour is condensed is at a temperature below the freezing point (32° F.) tiny ice crystals are formed these unite together and fall as snow.)

(Most of the rain that falls on the earth has come from the sea the water vapour is carried inland by wind. Whether the moisture of the vapour-bearing winds which blow from the sea to the land will be condensed or not depends on the temperature of the land. Thus Siberia receives little rain from winds which blow inland from the Arctic Ocean, because these winds have their temperature raised in passing over the land, and so condensation does not take place. But the winds of the Atlantic which blow across Europe and the

winds of the Pacific bring rain to Siberia; they blow from warmer to cooler regions, and as they become cooled rain falls.)

The elevation of the land also has a great effect upon the amount of rainfall. When vapour-bearing winds reach a mountain range they are forced up the mountain sides. As the vapour-laden air rises higher and higher, it expands and so cools; the vapour is thus condensed and falls as rain on the windward slopes of the mountains and on the plains below. When winds pass over the mountains they have not much moisture left in them to give rain to the country on the other side, which therefore gets much less rain than the country on the windward side. If the mountains are very high, the wind may be deprived of its moisture to such an extent



that no condensation will take place in the low-lying region beyond the mountains. Thus you find in

studying the geography of Australia that the prevailing easterly winds give good rain to the eastern highlands, but, having crossed the mountains, they descend to the plains, become warmer, and blow westward as dry winds

Questions.

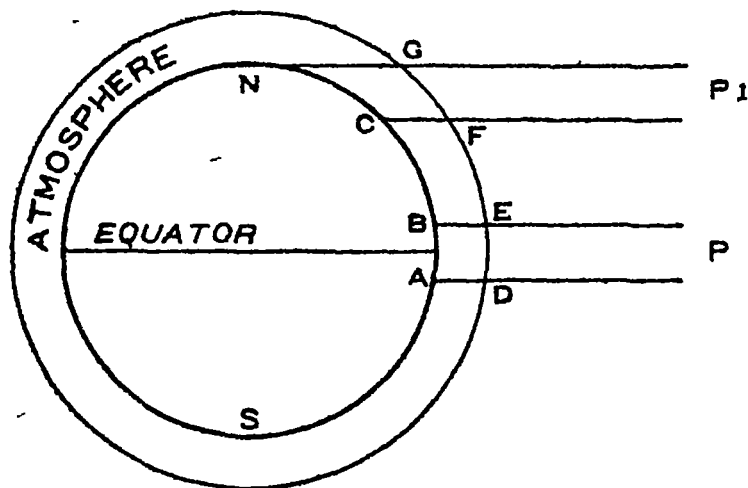
- 1 Explain how clouds are formed.
- 2 What conditions favour the deposit of rain by winds blowing inland from the sea?
- 3 Describe the effect of mountains on rainfall. Illustrate your answer by reference to the rainfall of India.

Climate.

The climate of a place is its general or average weather, and includes its temperature and rainfall, i.e., whether it is hot or cold, dry or moist. Climate depends mainly on the following — (i) Latitude, (ii) Elevation, (iii) Distance from the sea, (iv) Winds, (v) The position and direction of mountain ranges, (vi) Ocean currents. Let us consider these in order :—

(i) **Effect of Latitude :—**The amount of heat received on any part of the Earth's surface depends on the position of that part with regard to the rays of the Sun. Look at the diagram. Let P and P' be two equal beams of rays from the Sun. The amount of heat conveyed from the Sun by these

two beams is the same, but you will see that the area (A B), heated by the beam which falls on or near the Equator is much smaller than that (C N),



heated by a similar beam falling near the Pole. This, then, is one reason why it is hotter at the Equator than at the Poles. A given quantity of heat falling vertically at the Equator is received on a much smaller area than the same quantity of heat falling obliquely near the Poles.

The amount of heat which reaches the Earth also depends upon the thickness of the atmosphere, through which the rays have to pass. Look again at the diagram. The amount of atmosphere through which the rays travel near the Equator, is represented by D A or E B, while at the Pole the rays

pass through a thickness F C or G N The atmosphere takes up a certain quantity of the Sun's heat, and the amount which reaches the surface at the Pole is therefore less than at the Equator. Thus the temperature gradually decreases from the Equator to the Poles

(ii) **Effect of Altitude:**—The rays of the Sun do not give much heat directly to the air. The air is warmed chiefly by heat radiated outwards from the ground and ocean, which have been warmed by the rays of the Sun falling on them. Hence the higher layers of the atmosphere are colder than the layers near the surface. Another reason why the air is cold at high altitudes is that it is less compressed than at low altitudes, it expands to occupy more room, and you have already learned that air always cools when it expands. As a rule, the temperature of air decreases about 1° F. for every 300 feet of altitude.

(iii) **Distance from the sea:**—The water on the Earth's surface is more slowly heated than the land, and therefore is cooler in the summer. Hence places near the sea get the benefit of cool sea breezes in the hot weather. Thus, although Allahabad is further from the Equator than Madras it is hotter in the summer, because Madras is on the sea and Allahabad is an inland town. On the other hand, the water of the sea cools more slowly than the land

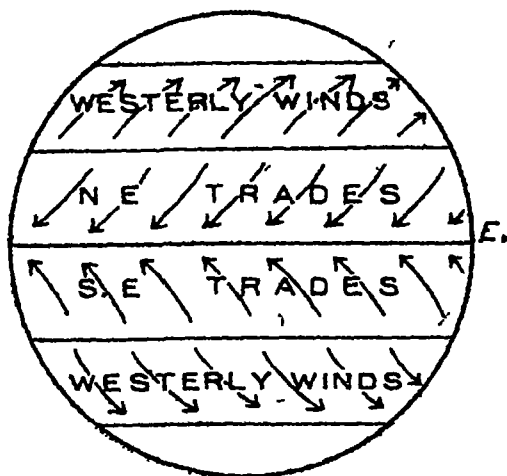
and so is warmer than the land in winter ; so places on the coast are warmed by sea breezes in the winter Hence we find that places near the sea are cooler in the summer and warmer in the winter than inland places, on account of the sea breezes which blow over them

(iv) **Winds** :—The movement of the air which we call wind is due to the distribution of the heat of the Sun over the Earth's surface

You know that heated air rises, for you have often seen steam rising from boiling water or smoke from a fire So along the hot belt of the Earth's surface heated air is constantly rising to higher regions of the atmosphere, and air from the north and south of the Equator is always blowing in to fill up the space If the Earth were at rest these winds would blow due north and south, but it is, as you know, constantly rotating on its axis from west to east, and the winds therefore change their direction and blow from north-east and south-east (See diagram, p 220) These winds blow within the tropics and a little beyond, and are known as the **Trade Winds**, because, in olden times, when there were no steamers, and ships were driven along by the wind, the sailors could always depend upon them to help them in carrying on their *trade* by sea.

The heated air which rises from the hot belt goes at first straight up into the atmosphere, but

after a time it turns to north and south and flows as two upper currents towards the poles These



currents gradually descend until they reach the surface again just beyond the tropics and continue their journey polewards as surface winds Again, the rotation of the Earth alters their course They do not blow directly north and south, but they are changed into south-west winds in the northern hemisphere, and north-west winds in the southern hemisphere These winds are often called, shortly, **Westerly winds.** (See diagram above)

Thus the prevailing winds on the Earth's surface blow in four belts, two in the northern hemisphere and two in the southern You will easily understand that, where they blow over the ocean, they

bring rain to the shores of the countries towards which they blow; and you should notice carefully that the trade-winds bring rain to the eastern shores of countries in the torrid zone, while the westerly winds give rain to the western shores of countries in the temperate zone. Look at the map of the world and say which countries get rain from the westerly winds (a) in the northern hemisphere, and (b) in the southern hemisphere. Say also which countries receive rain from the trade-winds.

Land and Sea Breezes:—Places near the sea-coast have a daily change of wind. Land gets hotter during the day-time than the sea. Hence the wind blows from the sea towards the land. But at night the opposite takes place. The land is now cooler than the sea, and the breeze blows seawards. These breezes are strongest in hot countries, for there the Sun is powerful enough to cause a considerable difference between the temperature by day and by night.

The Monsoons which occur in India and other countries of South-east Asia are similar to land and sea-breezes. During the summer months the Sun is shining vertically north of the Equator, and the interior of Asia therefore gets very hot. Hence the south-east trade-wind is drawn northwards towards the land, and blows over India as a south-west wind, bringing much moisture from the

Indian Ocean. It is on the rain brought by the summer south-west monsoon winds that India and the adjoining countries of South-east Asia depend



S W Monsoon

for their harvests and their food supply. In the cool half of the year the Sun is overhead south of the Equator, and the north-east trade-wind is drawn southwards and blows over India as a dry wind giving very little rain. This is because it has come from the interior of Asia, and has therefore very little moisture. The only part of India which gets good rain from the winter north-east monsoon is the coast of Madras, and you will observe that the wind which brings this rain has crossed the Bay of Bengal, and has taken up moisture on this part of its journey.

Thus the summer monsoon may be compared to a sea-breeze, that is, a wind blowing from the sea to

the land, and the winter monsoon to a land breeze or a wind blowing from the land to the sea. The important difference is that, whereas the period of change for land and sea breezes is a day, in the case of the monsoons it is a year.



N E Monsoon

(v) **Mountain Ranges**:—You have already learned that mountain ranges have an important effect on the distribution of rainfall. Mountains also act as barriers and prevent the flow of cold or warm winds. The reason why the climate of North America is cold in winter, even as far south as the centre of the United States, is that there is no mountain barrier to prevent the cold winds from the north blowing towards the south.

(vi) **Ocean Currents**:—These are described on pages 227-231. You will find that they have an important influence on climate.

Questions.

1 Explain clearly why, as a general rule, a place is hotter the nearer it is to the Equator. Illustrate your answer by a diagram.

2 Explain why, as a general rule, inland places are hotter in summer and colder in winter than places on the sea-coast.

3 Explain why the temperature of the air decreases with altitude.

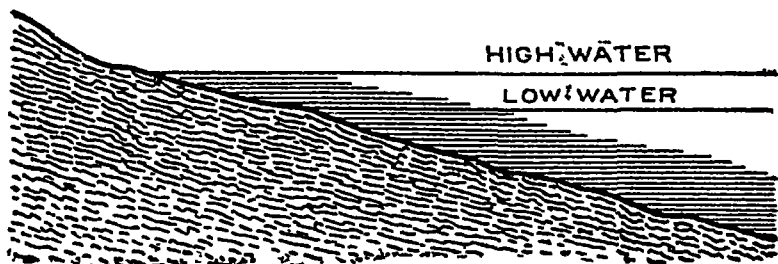
4 Account for and describe the following: trade-winds, westerly winds, monsoons.

The movements of the Ocean.

Waves:—The surface of the sea is never at rest. It is constantly moving with that up-and-down motion, which we call waves. These waves are caused by the wind. When a puff of wind blows against a small portion of any water-surface, the water at that place is pressed down, causing the water beside it or around it to be pressed upwards. If now the wind ceases to blow for an instant, the depressed water again rises, and the surrounding particles fall. Thus the water *rises* and *falls*, and you can easily see that if the wind blows for any length of time, or over a considerable area, the surface will soon become uneven. It will be covered with waves.

Tides:—You will best understand the movement of the ocean known as the tides, if you imagine yourself spending a day on the shore at Bombay.

or Karachi, or some other sea-side place. You go out in the morning, and you perhaps find that a wide stretch of the beach is dry. You walk down to the water's edge, and sit down to enjoy the view of the sea, with the boats in the distance, and the waves breaking gently, not far away. Presently you notice that the water is gradually getting nearer to you, and you are obliged to get up and walk farther up the beach. The advance of the sea continues, until the part of the beach which was dry is covered with water, and then it retreats

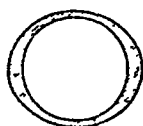


again, and leaves the shore exposed once more. The advance of the water is called the *flow* of the tide, and the retreat its *ebb*. In the former case, the tide is rising, in the latter it is falling. The time taken in rising and falling is about 12 hours, thus there are two tides a day.

A full explanation of the cause of the tides is not possible without the help of advanced mathematics. We must content ourselves with a statement of what happens

Owing to the force, known as "gravity," the Sun and the Moon both exert attraction on the waters of the Earth. Although the Moon is much smaller than the Sun, it is nearer to the Earth, and therefore its attractive force on the waters of the Earth is greater than that of the sun, it is, in fact, more than twice that of the Sun.)

(For the sake of simplicity, let us imagine the whole of the Earth's surface to be covered with water. The water on the part of the Earth nearest the Moon is more attracted than the centre of the Earth, and the centre of the Earth is more attracted than the water on the part of the Earth most remote from the Moon. Thus the water covering takes up the shape shown in the figure, a wave crest extend-



Earth.



Moon.

ing from the North to the South pole is heaped up on the side of the Earth nearest the Moon, and a similar wave crest is heaped up on the side remote from the Moon. Since each part of the Earth's surface is brought alternately opposite the Moon and away from it in the course of a day, these wave crests move round the World as the Earth rotates on its axis, each making one complete revolution

in a day, every part of the Earth therefore gets two tides in twenty-four hours

Tides are of great benefit to those ports where the water is shallow, for ships, which otherwise might not be able to use the port at all, can enter and leave at high tide)

Ocean Currents:—The third movement of the ocean is that of the broad streams which flow in fixed courses in the ocean, just as rivers do on the land. These are called **currents**. Ocean currents are due to two main causes: (a) the unequal heating of the water in different parts of the Earth's surface, and (b) prevailing winds. The constant heat in the tropics causes the water there to expand and to flow to cooler regions north and south. The surface water in the frigid zones, on the other hand, is continually being cooled, it therefore contracts and tends to sink, its place being taken by the warmer water from the tropics. The *prevailing winds* also, blowing constantly in the same place and direction, set the surface water in motion. You read in a former paragraph about the prevailing winds of the Earth's surface, and if you think of them in connection with the oceans you will see that there are five areas to be considered: three south of the Equator,—the Indian Ocean, the South Pacific and the South Atlantic; and two north of the Equator,—the North Pacific and the North

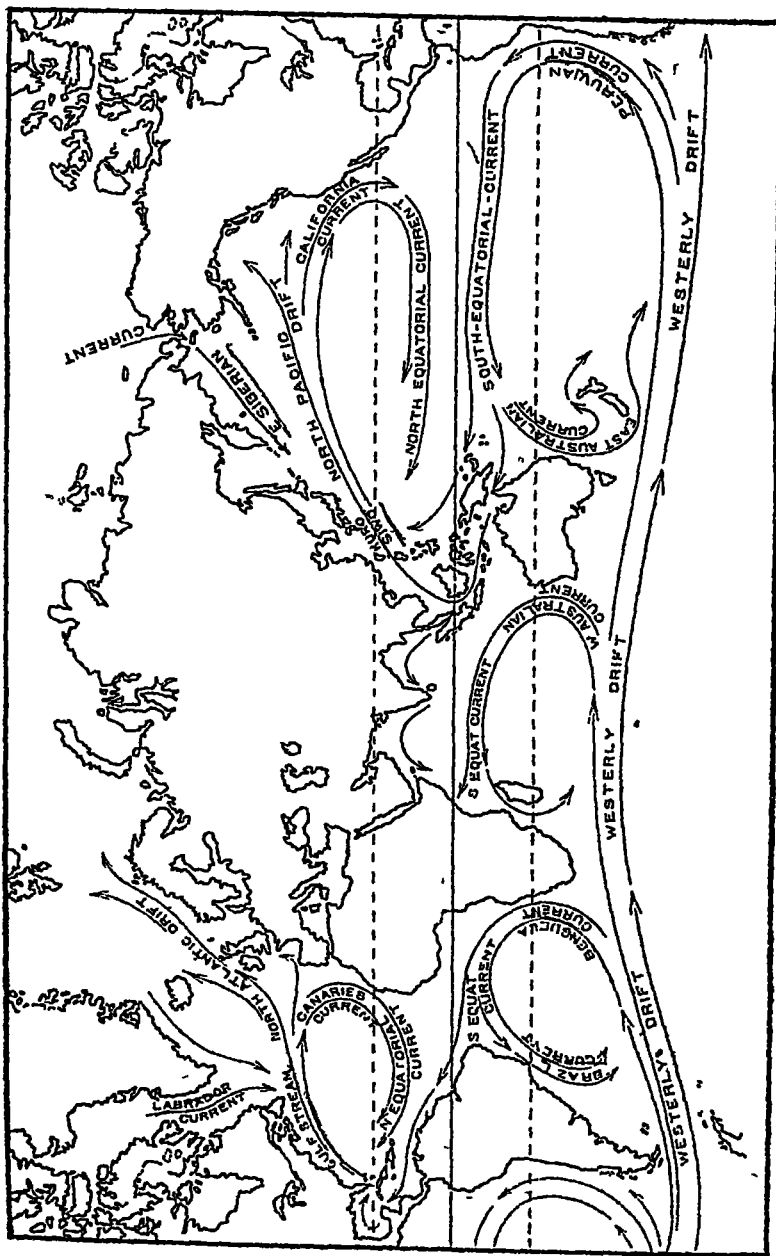
Atlantic Oceans. As the system of winds in each of the areas in the same hemisphere is similar, the system of currents will be similar too. It will be sufficient, then, if we examine one system in each hemisphere, but as you study that system, you should compare it very carefully with the others to see how closely they correspond. You will learn much more about the currents by studying the map than by reading descriptions of them.

Let us trace, then, on the map, the currents of the South Atlantic area. The **Westerly Drift**, which encircles the globe, flows as a cold current towards the south of Africa, where a branch travels north along the west side of that continent towards the Equator. At the Gulf of Guinea it turns to the west and joins the **South Equatorial Current**, which is caused by the south-east trade-wind, and flows across the Atlantic towards the coast of South America. The eastern angle of Brazil divides the current into two, one part goes north-west towards the Gulf of Mexico, the other part is turned to the south and flows along the east coast of South America to rejoin the westerly drift. Thus there is a complete circle of moving water in the South Atlantic Ocean—a cold current flowing along the south of the ocean, and northwards along the west of Africa, and a warm current flowing across the middle of the ocean, and southwards

along the east of South America. You should now find the corresponding currents in the South Pacific and Indian Oceans. Observe that a cold current flows along the western shores of the southern continents, and a warm current along their eastern shores. What will be the effect of this on the climate?

Now let us turn to the system of currents in the North Atlantic Ocean, which you should carefully compare with those of the North Pacific. Here, again, an **Equatorial Current** flows under the influence of the north-east trade-wind from east to west, joining the branch of the South Equatorial current, which has skirted the northern shores of South America. The united current sweeps round the Gulf of Mexico, and leaves this opening as a warm current, known as the **Gulf Stream**. It washes the shores of the United States, and then, under the influence of the westerly winds, it spreads across the ocean as the **North Atlantic Drift**, moderating the climate of the whole of Western Europe. Part of this drift sweeps round to complete the circle by rejoining the north Equatorial current.

One more current in the North Atlantic you must notice, and that is the cold *Labrador current*, from the Arctic Ocean, whose icy waters make the American shores north of Newfoundland very cold.



The Ocean Currents.

The fogs of Newfoundland are due to the meeting of the cold current from the north and the warm current from the south.

You should now compare the currents of the North Pacific with those described above. The **Kuro Siwo**, or Japanese current, corresponds with the Gulf Stream. The mild climate of western Canada, like that of western Europe, is the result of this warm westerly drift, and the cold climate of East Siberia is due to a Polar current like the similar climate of Labrador.

Questions.

1 What do you mean by a wave? Distinguish between waves and currents

2 Explain briefly how tides are formed. Tides are said to 'flow' and 'ebb.' Give, as clearly as you can, the meanings of these words

3 Describe the system of currents in the Atlantic Ocean (a) south of the Equator, (b) north of the Equator

4 How do you account for the fact that the systems of currents in the different oceans in the same hemisphere, are very similar?

5 Give examples to show that ocean currents affect climate

6 On a map of the Atlantic Ocean, show the chief currents

7 Do the same on a map of the Pacific Ocean and the Indian Ocean